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SCIENCE FOR SOCIETY: A Bibliography

by
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for
The Commission on Science Education
American Association for the Advancement of Science

Preparation and publication supported by the
National Science Foundation, Washington, D. C., and
Battelle Memorial Institute, Columbus, Ohio

SP003890

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Printed in the United States of America

AAAS Miscellaneous Publication 70-6
BMI Special Publication 70-1-50

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FOREWORD

Many people are deeply concerned about the future of man. There are several valid reasons for this apprehension. Atomic, radiological, chemical, and biological means for warfare threaten swift escalation, in a mistrustful world of international anarchy and massive annihilation for upwards of a billion individuals. There are approximately thirty tons of T.N.T. equivalent in atomic weapons for every man, woman and child on earth. These are widely distributed and mounted in many different weapons systems with many different means for delivery. No individual, no group of individuals, no nation, and no group of nations can insure life, liberty, and well-being, locally or generally. Nations do not seem to be moving generally toward reduction of tensions and elimination of risks; they are instead continuing to move apparently willy-nilly in the opposite direction. No armaments can contribute to man's welfare except perhaps to buy time. It is what is done with the time that counts.

Famine with its companion, disease, stalks many parts of the world at this moment. Malnutrition provides the world's most extravagant spoilage of physical development and intelligence. Millions now living are consigned to starvation to death unless something drastic is done immediately about food production and distribution.

On a somewhat less compelling scale of risks lies the very real possibility of ruining the whole biological and ecological balance of the world through mismanagement and pollution. This is affecting initially mainly the most civilized regions, but unless put in check promptly it will inexorably engulf all habitable areas of the globe.

Imbalance of resources and wealth, erosion of old cultures, corrosive poverty, political rigidity, and racial conflicts all bear upon mankind in the context of a growing realization that changes for the better are not only possible but can, potentially, be achieved in time to preclude any of these tragedies from overwhelming the world.

Men have had to think their way out of difficulties since time immemorial, on lesser scales of territory, intensity, and complexity and on a generally longer scale of time. It is the human brain that must do the work. It is necessary for many individuals in many lands to recognize the difficulties, to imagine achievable solutions, and to translate these solutions into substantial means for constructive adaptation on a world-wide scale. Nothing short of this will do.

It remains to be seen whether evolution has succeeded in producing an unsuccessful freak of nature, man, who will die out of his own confounding and drag along in his self-destruction much of the rest of evolution, or whether mankind will cross the threshold to eliminate the greatest risks and perturbations in favor of all mankind being able to enjoy a secure life with improved qualities in all of its dimensions. Within one generation, for the first time since the origins of the earth, both the most dreadful and the most vaunted potentialities for life have become achievable. What will you have?

Professor John Moore has undertaken to help students and teachers discover for themselves the present state of the human condition and to inquire for themselves concerning the evolutionary experiment now ongoing involving the transition between

man being mainly *Homo faciens*, the doer, the manufacturer, and *Homo sapiens*, the wise one, a name that we have aspired to but which we have not yet achieved except occasionally. The Commission on Science Education defines education in relative terms: one person being more educated than another on grounds that he knows to a fuller extent what may be the consequences of events. Any given individual is likely to have some areas of particular individual competence. Even the best educated individual is likely to have notable weaknesses. The Commission claims that education is not enough. We define a wise person also in relative terms: one person being wiser than another on grounds that he knows, and is positively empathic towards, the social consequences of events.

The Commission, in all of its undertakings, seeks to improve not only science education but the wise utilization of science and technology. Professor Moore has assembled an impressive bibliography, mostly from his own holdings. Making this bibliography widely available should help many of us to become better educated and wiser in respect to the present predicaments and present options facing mankind. Professor Moore, with the Commission standing behind him, launches this volume in the hope that others will contribute to its improvement in subsequent editions and updatings. We do so in the trust that students and teachers alike will be enabled to throw their weight in the balance favoring the long range advantages for all mankind.

April 7, 1970

Robert B. Livingston, M. D.
Chairman
Commission on Science Education

PREFACE

As man's population density and affluence increase, his difficulties in living with himself, with his neighbors, and with the living and nonliving world also increase – and at an alarming rate. Many thoughtful men believe that *Homo sapiens,* the "wise man", must put his wisdom to good use if he is to avoid a catastrophe to his civilization. Few would deny that man now has sufficient information to make the world a satisfying home. But very few believe that it will ever be unless he radically alters his actions, plans, and prejudices. Science and technology may be able to suggest ways to solve man's problems but, unless these ways are accepted, there will be no solutions.

Teachers must bear a heavy responsibility for insuring the use of scientific knowledge for the benefit of man. They must join the ever-increasing group of scientists, technologists, and concerned laymen who are giving serious thought to problems of population, food, pollution, race, aggression, and the quality of life. In an effort to assist the teacher and others interested in increasing their knowledge of these problems, we offer the following bibliography.

There are two main classes of references in this list. First, books – with an emphasis on paperbacks that are inexpensive and easy to obtain. Second, articles that have appeared in various scientific journals and popular magazines. The articles forming the core of the list appeared in *Science* and the *Scientific American* in the decade 1960-1969. These two journals are outstanding in the amount of attention they devote to the subject of science and society and they are usually available in school libraries and public libraries. In addition, the following have been checked for appropriate references: *American Scientist* (1965-1969), *Atlantic* (1965-1969), *Bioscience* (1967-1969), *Bulletin of the Atomic Scientists* (1965-1969), *Center Magazine* (1967-1969), *Daedalus* (1961-1969), *Environment* (1965-1969), *Esquire* (1967-1969), *Fortune* (1968-1969), *Harper's* (1965-1969), *Natural History* (1960-1969), *New Republic* (1969), *New Scientist* (1968-1969), *New York Review of Books* (1969), *Perspectives in Biology and Medicine* (1965-1969), *Saturday Review* (1968-1969).

Our goal has been to provide teachers with current references and, from these, easy access to the older literature. Even though more than 100,000 pages have been scanned, this bibliography is far from complete.

Both *Science* and the *Scientific American* have valuable information that has not been included in this bibliography. Each issue of *Science* has a section "News and Comment" that consists almost entirely of material relating to science and society. And do not overlook the weekly editorial in *Science*: it is nearly always humane, thoughtful, and pertinent. The *Scientific American* has a smaller and somewhat similar section "Science and the Citizen." The "Features and News" section of *Bioscience* should also be consulted.

Articles in *Science* and the *Scientific American* are often on controversial subjects. This is not surprising since, after all, they are dealing with unresolved problems. Both journals allow the dissenting reader his say; thus, should you be interested in an article, be sure to examine the next few issues for you will generally find valuable appraisals of

the original article. For example, *Science* for May 2, 1969, contained an article by Judith Blake on population policy. The July 11 issue carried comments and criticisms by several readers, with replies by Dr. Blake. On July 25 a long article criticizing Dr. Blake's views was published together with her reply.

Keeping up to date. The flood of articles appearing in nearly all magazines and newspapers would seem to suggest that man derives vicarious gratification from reading about his collective articles that mess up the world. Or possibly it is no more than an age-old fascination with a *danse macabre.* But more often than not, articles in the popular press about pollution, population, and so forth lack balance, scientific accuracy, and sufficient information for teachers.

Probably the single most useful source of current information for the teacher is *Science,* with its general articles, "News and Comment" section, and book reviews. But there are many other sources that are exceedingly important. The following information is given in case you might find it easier to keep informed by reading your own copies of journals rather than the library's.

Science. Published by the American Association for the Advancement of Science, 1515 Massachusetts Avenue, Washington, D.C. 20005. Weekly. Annual subscription $12.00. Free to members of the AAAS.

Scientific American. 415 Madison Avenue, New York, N.Y. 10017. Monthly. Annual subscription $10.00.

Bioscience. Published by the American Institute of Biological Sciences, 3900 Wisconsin Avenue NW, Washington, D.C. 20016. Sent to members of the AIBS and some of the affiliated societies. Institutional subscriptions are $18.00 a year ($20.00 outside of the Americas).

Daedalus. Published by the American Academy of Arts and Sciences, 280 Newton Street, Brooklyn Station, Boston, Mass. 02146. $7.50 a year. Four issues a year, each 200-300 pages. Each issue generally considers a single topic in great depth, such as "Color and race", "The American Negro", "Utopia", "Science and culture", "Science and technology in contemporary society".

Bulletin of the Atomic Scientists. A Journal of science and public affairs (935 E. 60 Street, Chicago, Ill. 60637). Ten issues a year $8.50.

The Center Magazine. Published six times a year by the Fund for the Republic, 2056 Eucalyptus Hill Road, Santa Barbara, California 93103. Available to all associate members of the organization. Annual dues $10.00. Members receive other publications as well. A scholarly journal dealing with general problems of society.

Environment. Published by the Committee for Environmental Information, a group that has done pioneering studies on pollution and misuse of the

environment. Ten issues a year for $8.50. Orders may be sent to *Environment,* 438 North Skinker Boulevard, St. Louis, Missouri 63130.

Nature. (Subscription Department, Macmillan (Journals) Ltd. Brunel Road, Basingstoke, Hampshire, England. $48.00 by air). This English weekly journal has articles and comments relating to science and society.

New Scientist. Another English weekly. Less technical than *Nature*. Annual subscription $16.00. New Scientist, 128 Long Acre, London WC2, England.

Of the more general periodicals, *Atlantic, Harper's, Life, Look, Newsweek, Saturday Review,* and *Time* (with its special section "Environment") frequently contain articles in the general area of science and society.

In addition to the standard scientific abstracting journals (*Biological Abstracts, Chemical Abstracts,* etc.) the *Reader's Guide to Periodical Literature* should be consulted. It lists articles under headings such as Population, Pollution, Conservation, and Race, that appear in the general periodicals and more popular scientific journals.

Getting started. For those teachers who desire a general introduction to the subjects covered by this bibliography, and who have a limited time to devote to the project, may I suggest these books as a start – and in the order given:

Brown, Harrison. 1954. *The Challenge of Man's Future.* New York: Viking Compass Edition. $1.65.

National Academy of Sciences. 1969. *Resources and Man.* San Francisco: W. H. Freeman. $2.95.

Udall, Stewart. 1968. *1976: Agenda for Tomorrow.* New York: Harcourt, Brace & World. $3.75.

Greenberg, Daniel S. 1967. *The Politics of Pure Science.* New York: The New American Library. $7.95.

Ehrlich, Paul. 1968. *The Population Bomb.* New York: Ballentine. $0.95.

Scientific American Readings. 1969. *Science, Conflict and Society.* San Francisco: W. H. Freeman. $5.75.

Classification of topics. It is becoming ever clearer that the problems of man and his environment are closely interrelated and depend largely on his numbers. He needs more food because he is becoming more numerous. The more there are of him, the greater the pollution and devastation of the environment. As he crowds into cities, problems of crime, racial tension, and health increase. Many of the references listed deal with these and related subproblems; in an effort to aid the teacher, an attempt has been made to arrange the references under the descriptive subject headings given in the Table of

Contents. The references under each heading are divided as **books** and **articles.** In the case of symposia, the listing is by the first author (plus "and others") and the name of the symposium.

Acknowledgments. I am deeply grateful to the following individuals for comments on the manuscript of this bibliography: Bernard Barber, Jerry S. Carlson, Marian Carpelan, Eugene H. Cota-Robles, Sally Gall, Robert Glaser, William T. Kabisch, Edward J. Kormondy, William V. Mayer, Don E. Meyer, Betty C. Moore, James A. Oliver, Ingrith Olsen, Melba Phillips, and James T. Robinson.

March 24, 1970

John A. Moore

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1. GENERAL REFERENCES

GENERAL REFERENCES/books

American Association for the Advancement of Science. 1967. Man, Culture, Animals: the role of animals in human ecological adjustments. Washington. *AAAS Publication No. 78.* $8.00.

Bates, Marston. 1964. *Man in Nature.* Englewood Cliffs. New Jersey: Prentice-Hall. $1.95.

Bell, Daniel. Editor. 1969. *Toward the Year 2000: Work in Progress.* Boston: Beacon Press. $3.50.

Benarde, Melvin A. 1969. *Our Precarious Habitat.* New York: Norton. $6.95. An integrated approach to understanding man's effect on his environment. (Scheduled for publication in the spring of 1970.)

Borgstrom, Georg. 1969. *Too Many: The Biological Limitations of Our Earth.* New York: Macmillan. $7.95.

Bresler, Jack B. Editor. 1966. *Human Ecology: Collected Readings.* Reading, Mass.: Addison-Wesley. $10.50. An anthology of 30 papers – some duplicated in the reference below.

Bresler, Jack B. Editor. 1968. *Environments of Man.* Reading, Mass.: Addison-Wesley. An anthology of 24 articles on a broad variety of topics concerned with man, his environment, and his society. $3.95.

Brown, Harrison. 1954. *The Challenge of Man's Future.* New York: Viking Compass Edition. $1.65. One of the outstanding books on the relation of population size and available resources. Possibly the best introduction to the field.

Brown, Harrison et al. 1963. *The Next Hundred Years: Man's Natural and Technological Resources.* New York: Compass-Viking. $1.45. See also: "The Next Ninety Years" 1967. Pasadena: California Inst. of Technology Press.

Bush, Vannevar. 1967. *Science Is Not Enough.* New York: Morrow. $4.50.

Calder, Nigel. 1967. *Eden Was No Garden: An Inquiry into the Environment of Man.* New York: Holt, Rinehart and Winston. $4.95. Food, population, technology.

Comfort, Alexander. 1966. *The Nature of Human Nature.* New York: Harper and Row. $1.25. Man's biology, evolution, variability, enemies, food, environment, ageing, and future.

Commoner, Barry. 1966. *Science and Survival.* New York: Viking compass Edition. $1.35.

Daedalus. The American Academy of Arts and Sciences. $1.25. The Summer 1967 issue is devoted to "Toward the Year 2000: Work in Progress". Many scholars attempt to predict our future – in all aspects including science, technology, and society. (See also Daniel Bell 1969.)

Daedalus. The Fall 1967 issue is devoted to America's changing environment.

Darling, F. F. and J. P. Milton. Editors. 1966. *Future Environments of North America.* Garden City, New York: Doubleday-Natural History Press. $12.50.

Darlington, C. D. 1969. *The Evolution of Man and Society.* London: George Allen and Unwin. $12.50.

Dubos, René J. 1961. *The Dreams of Reason: Science and Utopias.* New York: Columbia University Press. $1.75.

Dubos, René. 1965. *Man Adapting.* New Haven: Yale University Press. $2.95. The emphasis is on man and his health, but the entire relation of man and his environment is explored.

Dubos, René. 1968. *So Human an Animal.* New York: Scribner's. $2.25. A scientist and humanist considers man's demuninization.

Ehrensaft, Philop and Amitai Etzioni. 1969. *Anatomies of America: Sociological Perspectives.* New York: Macmillan. $4.95. An anthology of 53 papers, including ones on race, cities, drugs, and population.

Ewald, William R. 1967. *Environment for Man: The Next Fifty Years.* Bloomington: Indiana University Press. $2.95.

Goodman, Gordon T. and others. Editors. 1965. *Ecology and the Industrial Society.* New York: John Wiley. $11.95. 16 papers from a symposium of the British Ecological Society.

Hardin, Garrett. 1969. *Population, Evolution, and Birth Control.* A collage of controversial ideas. San Francisco: Freeman. $2.95. (123 selections – an excellent source.)

Hardin, Garrett. 1969. *Science, Conflict and Society.* Readings from Scientific American with introductions by Garrett Hardin. San Francisco: Freeman. $5.75. (See notes following "Scientific American" entry.)

Hay, John. 1969. *In Defense of Nature.* Boston: Atlantic - Little, Brown. $4.95. Our destruction of the natural world and a suggestion that this is unwise.

Jackson, Ellen. 1968. *Subject Guide to Major United States Government Publications.* Chicago: American Library Association. $5.50.

Jennings, Burgess H. and John E. Murphy. Editors. 1966. *Interactions of Man and His Environment.* New York: Plenum Press. $9.50. Proceedings of a conference.

Lowry, William P. 1969. *Weather and Life: An Introduction to Biometerology.* New York: Academic Press. $5.95.

MacKenzie, Norman. Editor. 1966. *A Guide to the Social Sciences.* New York: Mentor Book. $1.25. Brief introductions to the field of history, anthropology, sociology, economics, government, and social psychology. Short bibliographies.

Mead, Margaret. 1970. *Culture and Commitment. A Study in the Generation Gap.* New York: Doubleday. Natural History Press.

Michael, Donald N. 1968. *The Unprepared Society: Planning for a Precarious Future.* New York: Basic Books. $4.95.

National Academy of Sciences. 1969. Committee on Resources and Man of the Division of Earth Sciences. *Resources and Man.* San Francisco: W. H. Freeman. $2.95. Discusses man's ecology, population, food, minerals, energy.

Osborn, Fairfield. 1948. *Our Plundered Planet.* Boston: Little, Brown. $1.95.

Rienow, Robert and Leona T. Rienow. 1967. *Moment in the Sun.* New York: Ballentine Books. $.95.

Scientific American. 1969. *Science, Conflict, and Society.* Introductions by Garrett Hardin. San Francisco: W. H. Freeman. $5.75. Articles from the Scientific American assembled under these topics: Scientists and Society, The Roots of Social Behavior, Population and Heterogeneity Problems, What Price Progress?, War.

Shepard, Paul and Daniel McKinley. Editors. 1969. *The Subversive Science.* Essays toward an ecology of man. Boston: Houghton Mifflin. $8.95.

Stewart, George Rippey. 1968. *Not So Rich as You Think.* Boston: Houghton Mifflin. $5.00. Population, garbage, air pollution, etc.

Storer, John H. 1968. *Man in the Web of Life.* New York: The New American Library. Signet Science Library. Q 3664 $.95.

Udall, Stewart. 1968. *1976: Agenda for Tomorrow.* New York: Harcourt, Brace and World. $3.75.

U. S. Department of Health, Education, and Welfare. 1969. *Toward a Social Report.* Washington: Government Printing Office. $0.55. How to plan for reporting the social health of the nation.

U. S. House of Representatives. 1968. Hearings before the subcommittee on Science, Research, and Development of the Committee on Science and Astronautics. *Environmental Quality.* Washington: U. S. Government Printing Office.

U. S. House of Representatives. 1969. Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries. *Environmental Quality.* Serial 91-6. Washington: U. S. Government Printing Office.

Waddington, C. H. 1969. *The Ethical Animal.* London: Geo. Allen and Unwin. $1.95.

Wilson, Billy Ray. Editor. 1968. *Environmental Problems: Pesticides, Thermal Pollution, and Environmental Synergisms.* Philadelphia: Lippincott. $5.25. Discussions also of environmental health sciences, urban development, behavior of man.

Wylie, Philip. 1968. *The Magic Animal.* Garden City, N. Y.: Doubleday. $0.95.

GENERAL REFERENCES/articles

AAAS Committee---. 1960. Science and human welfare. *Science,* **132**: 68-73.

AAAS Committee---. 1961. Science and human survival. *Science,* **134**: 2080-2083.

Bouillenne, R. 1962. Man, the destroying biotype. *Science,* **135**: 706-712.

Brooks, Douglas L. 1967. A statement of the problem: environmental quality control. *Bioscience,* **17**: 873-877.

Brown, Harrison S. 1968. Population resources and technology. *Bioscience,* **18**: 31-33.

Cassidy, Harold G. 1967. On incipient environmental collapse. *Bioscience,* **17**: 878-882.

Cole, LaMont. 1966. Man's ecosystem. *Bioscience,* April 1968, p. 243-248.

Cole, LaMonte C. 1968. Can the world be saved? *New York Times Magazine,* 31 March 1968, p. 35 ff.

Cole, LaMont C. 1968. Can the world be saved? *Bioscience,* **18**: 679-684.

Commoner, Barry. 1968. Nature under attack. *Columbia University Forum,* Spring 1968, p. 17-22.

Crewe, Albert V. 1967. Science and the war on . . . *Physics Today,* October 1967, p. 25-30. How science can aid in solutions of problems such as pollution and crime.

Crowe, B. L. 1969. The tragedy of the commons revisited. *Science,* **166**: 1103-1107. Refers to Hardin 1968.

Darling, Frank Fraser and Raymond F. Dasmann. 1969. The ecosystem view of human society. *Impact,* **19**: 109-121.

Darling, Frank Fraser and others. 1969. Human-engineering the planet. *Impact,* **19**: 105-219. A group of articles on ecosystems and man, space research, water, climate, cities, land use.

Dubos, René. 1965. Humanistic biology. *American Scientist,* **53**: 4-19.

Ehrlich, Paul and others. 1969. The biological revolution. *Center Magazine,* November 1969, p. 28-49. The report of a conference that discussed the implications of the biological revolution such as "Medical Ethics", "Human Decision and Human Dignity", "Assessment of Technology and Science", "Environment and the Law", "Is it Science or Technology", "Law or Education", "Recommendations and Conclusions".

Etzioni, A. 1968. Sex control, science, and society. *Science,* **161**: 1107-1112.

Farvar, M. Taghi Editor. 1969. The unforeseen international ecologic boomerang. *Natural History.* February 1969, p. 41-72. A series of papers showing how attempts to solve one ecological problem may inadvertently lead to new problems.

Ferry, W. H. 1969. The unanswerable questions. *Center Magazine,* July 1969, p. 2-7. Can we cope with a scientific-technological way of life?

Ford Foundation. 1968. Ecology: the new great chain of being. *Natural History,* December 1968, p. 8-16, 60-69. A Ford Foundation press conference.

Frederiksen, Harald. 1969. Feedbacks in economic and demographic transition. *Science,* **166**: 837-848.

Galbraith, J. K. 1964. Economics and the quality of life. *Science,* **145**: 117-123.

Gomer, Robert. 1968. The tyranny of progress. *Bulletin of the Atomic Scientists,* February 1968, p. 4-8.

Gulick, Addison. 1968. A biological prologue for human values. *Bioscience,* **18**: 1109-1112.

Hardin, G. 1968. The tragedy of the commons. *Science,* **162**: 1243-1248. See also Crowe 1969.

Hartley, Harold. 1965. Man and nature. *American Scientist,* **53**: 127-137. Food, population, history.

Henkin, Harmon. 1969. Side effects. Report of a Conference on Ecological Aspects of International Development. *Environment,* January-February 1969, p. 28-35, 48. Some unforeseen consequences of trying to "do good".

Hoagland, Hudson. 1969. Technology, adaptation, and evolution. *Bulletin of the Atomic Scientists,* January 1969, p. 27-30.

Jackson, Henry M. 1967. Public policy and environmental administration. *Bioscience,* **17**: 883-885.

Johnson, Paul. 1969. A morality for a dynamic society. *New Scientist,* 4 December 1969, p. 506-507.

Jordan, P. A. 1968. Ecology, conservation, and human behavior. *Bioscience,* **18**: 1023-1029.

Kinzel, A. B. 1967. Engineering, civilization, and society. *Science,* **156**: 1343-1345.

Lonsdale, Kathleen. 1968. Science and the good life. *New Scientist,* **39**: 370-373.

Lyle, David. 1967. The human race has, maybe, thirty-five years left. *Esquire,* September 1967, p. 116-118, 176-183.

McCarthy, Callum. 1969. Making the best use of science. *New Scientist,* **41**: 460-462.

Morison, R. S. 1969. Science and social attitudes. *Science,* **165**: 150-156.

Nef, John U. 1969. The search for civilization. *Center Magazine,* May 1969, p. 2-6. Science cannot solve our problems, only man can.

Neisser, U. 1963. The imitation of man by machine. *Science,* **139**: 193-197.

Odum, E. P. 1969. The strategy of ecosystem development. *Science,* **164**: 262-270.

Paradise, Scott. 1969. The Vandal ideology. *Nation,* 29 December 1969, p. 729-732. Man's current ideology regarding nature is vandal-like. Changes are proposed.

Platt, John R. 1965. The step to man. *Science,* **149**: 607-613.

Platt, John R. 1966. Diversity (More diversity in our science, our patterns of living, and our education would enrich us all). *Science,* **154**: 1132-1139.

Platt, John. 1969. What we must do. *Science,* **166**: 1115-1121. A large-scale mobilization of scientists may be the only way to solve our crises.

Predmore, R. L. 1968. What role for the humanist in these troubled times? *Bioscience,* **18**: 691-693.

Price, D. K. 1965. Escape to the endless frontier. (How can science be related to our political purposes and to our economic and constitutional system?) *Science,* **148**: 743-749.

Ritchie-Calder, Lord. 1970. Mortgaging the old homestead. *Foreign Affairs,* **48**: 207-220. By populating and polluting, we are destroying our world.

Sears, Paul B. 1967. Beyond the forest. *American Scientist,* **55**: 338-346. A broad view of what we do to nature.

Shepard, Paul. 1967. What ever happed to human ecology? *Bioscience,* **17**: 891-894, 911.

Slobodkin, Lawrence B. 1968. Aspects of the future of ecology. *Bioscience,* **18**: 16-23. For aspects of the future of man.

Smith, C. S. 1965. Materials and the development of civilization and science. *Science,* **148**: 908-917.

Spilhaus, Athelstan. 1969. Technology, living cities and human environment. *American Scientist,* **57**: 24-36.

Ternes, Alan P. 1970. The state of the species. *Natural History,* January 1970, p. 43-74. Nine articles on our origin, proliferation, food, and the mess we are making.

Udall, Stewart L. 1965. The ecology of man and the land ethic. *Natural History,* June-July 1965, p. 32-41.

White, Jr., L. 1967. The historical roots of our ecologic crisis. *Science,* **155**: 1203-1207. Are in our Judeo-Christian Ethics.

Wiener, Anthony J. and Herman Kahn. 1967. Excerpts from "The year 2000". *Natural History,* November 1967, p. 10-18.

2. POPULATION PROBLEMS

POPULATION PROBLEMS/books

The references in Section 2 emphasizes the problems of overpopulation in man and, to a lesser degree, in other organisms. This section has two subsections, *2A. Cities* and *2B. Crowding and Aggression.* References to medical aspects of birth control are in Section 5. For related articles see also Sections 1 and 3.

Applebaum, Philip. 1966. *The Silent Explosion.* Boston: Beacon Press. $1.95.

Daedalus. The Spring of 1968 issue is devoted to "Historical Population Studies."

Day, L. H. and A. T. Day. 1965. *Too Many Americans.* New York: Dell. $1.95.

Ehrlich, P. 1968. *The Population Bomb.* New York: Ballantine. $.95.

Freedman, R. Editor. 1964. *Population: The Vital Revolution.* New York: Doubleday. $1.45.

Hauser, P. M. Editor. 1963. *The Population Dilemma.* Englewood Cliffs: Prentice-Hall. $1.95.

Johnson, C. E. Editor. 1968. *Social and Natural Biology: Selections from Contemporary Classics.* Princeton, N. J.: Van Nostrand. $2.95. One section devoted to "Evolution, eugenics, and population."

Malthus, Thomas, Julian Huxley, and Frederick Osborn. (1960). On Population: Three Essays. $0.60. New York: Mentor Books.

Ny, Larry K. Y. and Stuart Mudd. Editors. 1965. *The Population Crisis.* Bloomington: Indiana University Press.

Osborn, Farifield. Editor. 1962. *Our Crowded Planet.* New York: Doubleday. $4.50.

Petersen, William. 1964. *The Politics of Population.* New York: Doubleday Anchor Book. $1.45. Population growth, population planning, and migration from an international point of view.

Pincus, G. 1965. *The Control of Fertility.* New York: Academic Press. $9.00. By the father of the pill.

Sax, Karl. 1960. *Standing Room Only: The World's Exploding Population.* Boston, Beacon Press. $1.75.

Thompson, Warren S. and David T. Lewis. 1965. *Population Problems.* 5th Edition. New York: McGraw-Hill. $9.95.

U. S. Senate. 1965. Hearings before the Subcommittee on Foreign Aid Expenditures of the Committee on Government Operations. *Population Crisis.* 5 parts; *Ibid,* 1966, 6 parts; *Ibid,* 1967-8, 4 parts. Washington: U.S. Government Printing Office.

Vogt, William. 1960. *People! Challenge to Survival.* New York: W. Sloane Associates.

Vogt, William. 1948. *Road to Survival.* New York: W. Sloane Associates.

Young, Louise B. Editor. 1968. *Population in Perspective.* New York: Oxford University Press. $10.00.

POPULATION PROBLEMS/articles

Berelson, B. 1969. Beyond family planning. *Science,* **163**: 533-543.

Berelson, B. and R. Freedman. 1964. A study in fertility control. *Scientific American,* May 1964, pp. 29-37.

Berrill, N. J. et al. 1968. The child. *Saturday Review,* December 7, 1968, p. 71-88. A series of articles suggesting that the parents' right to have children should be balanced by a child's right to a normal life.

Blake, J. 1969. Population policy for Americans: is the government being misled? *Science,* **164**: 522-529. (See also *Science* **165**: 367-378).

Brooks, Robert R. R. 1969. Can India make it? *Saturday Review,* 9 August 1969, p. 12-16.

Clough, Garrett C. 1965. Lemmings and population problems. *American Scientist,* **53**: 199-212.

Davis, Kingsley. 1963. Population. *Scientific American,* September 1963, p. 62-71.

Davis, Kingsley. 1965. The urbanization of the human population. *Scientific American,* September 1965, p. 40-53.

Davis, Kingsley. 1967. Population policy: will current programs succeed? *Science,* **158**: 730-739.

Deevey, Jr., E. S. 1960. The human population. *Scientific American,* September 1960, p. 194-202.

Dorn, H. F. 1962. World population growth: an international dilemma. *Science,* **135**: 283-290.

Ehrlich, Paul R. and John P. Holdren. 1969. Population and panaceas; a technological perspective. *Bioscience,* **19**: 1065-1071.

Enke, S. 1969. Birth control for economic development. *Science,* **164**: 798-801.

Foerster, H. von, P. M. Mora, L. W. Amiot. 1960. Doomsday: Friday, 13 November, A.D. 2026. *Science,* **132**: 1291-1295.

Frank, Lewis C. 1968. People vs. population. *Center Magazine,* January 1968, p. 18-22.

Greep, Roy O. 1969. Prevalence of people. *Perspectives in Biology and Medicine,* **12**: 332-343. Eight consequences of overpopulation.

Harcourt, D. G. and E. J. Le Roux. 1967. Population regulation in insects and man. *American Scientist,* **55**: 400-415.

Hardin, Garrett. 1969. Remarkable reversal of time. *New Scientist,* 39: 480-482. Can mankind still afford the luxury of the Pope?

Harkavy, O. et al. 1969. Family planning and public policy: who is misleading whom? *Science,* 165: 367-373.

Hauser, P. M. 1960. Demographic dimensions of world politics. *Science,* 131: 1641-1647.

Hauser, P. M. 1961. The census of 1960. *Scientific American,* July 1961, p. 39-45.

Hauser, P. M. 1962. More from the census of 1960. *Scientific American,* October 1962, p. 30-37.

Hoagland, Hudson. 1964. Mechanisms of population control. *Daedalus,* Summer 1964, p. 812-829.

Howard, W. E. 1969. The population crisis is here now. *Bioscience,* 19: 779-784.

Huxley, Aldous. 1969. Second edition/The politics of population. *Center Magazine,* March 1969, p. 13-19.

Istock, Conrad. 1969. A corollary to the Dismal Theorem. *Bioscience,* 19: 1079-1081. An optimism is not the corollary.

Macinko, G. 1965. Saturation: a problem evaded in planning land use. *Science,* 149: 516-521.

Mayer, Jean. 1964. Food and population: the wrong problem? *Daedalus,* Summer 1964, p. 830-884.

Organski, A. F. K. 1961. Population and politics in Europe. *Science,* 133: 1803-1807.

Pimentel, D. 1968. Population regulation and genetic feedback. *Science,* 159: 1432-1437.

Potter, R. G. et al. 1968. Taiwan's family planning program. *Science,* 168: 848-853.

Revelle, Roger. 1966. Can man domesticate himself? *Bulletin of the Atomic Scientists,* February 1966, p. 2-7. It will be interesting to see.

Sanford, David. 1969. More studies, and more people. *New Republic,* May 24, 1969, p. 14-15.

Simpson, D. 1968. The dimensions of world poverty. *Scientific American,* November 1968, p. 27-35.

Spengler, Joseph J. 1960. Population and world economic development. *Science,* 131: 1497-1502.

Spengler, Joseph J. 1969. Population problem: In search of a solution. *Science,* 166: 1234-1238.

Stycos, J. M. 1964. The outlook for world population. *Science,* 146: 1435-1440.

Taylor, C. E. and M.-F. Hall. 1967. Health, population, and economic development. *Science,* 157: 651-657.

Taylor, Wallis. 1969. Our world, AD 2000. *New Scientist,* 43: 146-147. Crowded and poor.

Thompson, W. S. 1950. Population. *Scientific American,* 182: February 1950, p. 11-15.

Tinker, Jon. 1969. Man as epidemic. *New Scientist,* 44: 18-20. Britain's secret plans for population control.

Williamson, Francis S. L. 1969. Population pollution. *Bioscience,* 19: 979-983.

Wynne-Edwards, V. C. 1964. Population control in animals. *Scientific American,* August 1964, p. 68-74.

2A. Cities

CITIES/books

The agonizing problems of the cities demand special consideration. Civilization is the product of cities. Sustained progress in the arts and science requires vigorous interaction among men and, until recently, this was possible only where many men lived close to one another. Modern methods of transportation and communication have lessened the need for density to assure progress; nonetheless, cities remain sites of great creativity. Yet today man's problems are most acute in the city. A city may be huge, but as long as its citizens can find suitable employment and lead satisfying lives, there is no population problem. If they cannot, we observe the grim results of an excess of individuals above the carrying capacity of the community: enormous waste of human potential and tragic increases in crime, pollution, disease, poverty, and tension.

One of the best books for background information is Mumford's (1961). Isenberg's (1968) book is a collection of articles that would appeal to students. Tyler takes a tough look at the problems of cities in his 1969 article.

Refer also to Sections 1, 2, 2B, 4, 7, and 10.

Abrams, Charles. 1965. *The City Is the Frontier.* New York: Harper & Row. An excellent survey of urban problems. $1.95.

Bacon, Edmund. 1967. *The Design of Cities.* New York: Viking Press. A historical survey. $15.00.

Blake, Peter. 1964. *God's Own Junkyard: The Planned Deterioration of America's Landscape.* New York: Holt, Rinehart and Winston. A collection of photographs to carry the message.

Canty, Donald. Editor. 1969. *The New City.* National Committee on Urban Growth Policy. New York: Frederick Praeger. $12.50.

Churchill, Henry S. 1962. *The City Is the People.* New York: W. W. Norton. $1.95. A brief introduction to urban problems.

Daedalus. The Winter 1961 issue is devoted to "The future metropolis." (See also Lloyd Rodwin.)

Daedalus. The Fall 1968 issue is devoted to "The Conscience of the city."

Duhl, Leonard J. Editor. 1963. *The Urban Condition: People and Policy in the Metropolis.* New York: Basic Books. $10.00.

Eldredge, H. Wentworth. Editor. 1967. *Taming Megalopolis.* Volume I. What Is and What Could Be. Volume II. How to Manage an Urbanized World. New York: Praeger. A source for detailed information. $2.45 ea.

Faltermayer, Edmund K. 1968. *Redoing America: a Nationwide Report on How We Can Make Our Cities and Suburbs Livable.* New York: Harper and Row. $6.95.

Gottman, Jean. 1961. *Megalopolis: The Urbanized Northeastern Seaboard of the United States.* New York: The Twentieth Century Fund. $4.95. A detailed analysis of a restricted urban area.

Halprin, Lawrence. 1963. *Cities.* New York: Reinhold. $15.00.

Heckscher, August. 1962. *The Public Happiness.* New York: Atheneum. $5.75.

Holland, Laurence B. Editor. 1966. *Who Designs America?* Garden City, New York: Doubleday. Anchor Book. $1.45. Ten experts explore the urban environment.

Isenberg, Irwin. Editor. 1968. *The City in Crisis.* New York: H. W. Wilson. A paperback. $3.50. Collection of articles from newspapers and magazines. Particularly valuable for use in the classroom.

Jacobs, Jane. 1961. *The Death and Life of Great American Cities.* New York: Random House. $2.45. An excellent account of the problems and some suggestions for solutions.

Jacobs, Jane. 1969. *The Economy of Cities.* New York: Random House. $5.95.

Lynch, Kevin. 1960. *The Image of the City.* Cambridge: M.I.T. Press.

McHarg, Ian L. 1969. *Design with Nature.* Garden City, New York: Natural History Press (Doubleday). $19.95.

Mumford, Lewis. 1961. *The City in History: Its Origins, Its Transformations, and Its Prospects.* New York: Harcourt, Brace & World. $4.95. An excellent source book. Extensive bibliography.

Mumford, Lewis. 1968. *The Urban Prospect.* New York: Harcourt, Brace and World. Harvest Book. $2.45.

National Advisory Commission on Civil Disorders. *Report.* ("Kerner Report".) New York: Bantam Books. $1.25.

Rodwin, Lloyd. Editor. 1961. *The Future Metropolis.* New York: George Braziller. $5.00.

Scientific American. The entire September 1965 issue is devoted to "Cities."

Sirjamaki, John. 1964. *The Sociology of Cities.* New York: Random House. $5.95.

Spreiregen, Paul D. 1965. *Urban Design: The Architecture of Towns and Cities.* New York: McGraw-Hill. $12.50.

Stein, Clarence S. 1966. *Toward New Towns for America.* Cambridge: M.I.T. Press. Paperback. $3.95. Examples of newly designed towns.

Strauss, Anselm L. 1961. *Images of the American City.* New York: Crowell-Collier. The sociology of cities.

Tunnard, Christopher and Boris Pushkarev. 1963. *Man-made America: Chaos or Control: An Inquiry into Selected Problems of Design in the Urbanized Landscape.* New Haven: Yale University Press. $8.95.

U. S. Senate. 1966-1967. Hearings before the Subcommittee on Executive Reorganization of the Committee on Government Operations. *Federal Role in Urban Affairs.* 21 parts. Washington: U. S. Government Printing Office.

Von Eckardt, Wolf. 1967. *A Place to Live: The Crisis of the Cities.* New York: Delacorte Press. $2.65.

Weaver, Robert C. 1964. *The Urban Complex: Human Values in Urban Life.* Garden City, New York: Doubleday. $1.45.

Whalen, Richard J. 1965. *A City Destroying Itself: An Angry View of New York.* New York: Apollo. Paperback. $.95.

Wingo, Jr., Lowdon. Editor. 1963. *Cities and Space: The Future Use of Urban Land.* Baltimore: Johns Hopkins University Press. $2.45.

CITIES/articles

Adams, R. M. 1960. The origin of cities. *Scientific American,* September 1960, p. 153-168.

Carvalho, Jose C. de Melo. 1969. The city (I): From the cave to the megalopolis. *Impact,* 19: 169-177. See also Doxiadis 1969.

Doxiadis, C. A. 1968. Ivan's movement and his city. *Science,* 162: 326-334.

Doxiadis, Constantinos A. 1969. The city (II): Ecumenopolis, world-city of tomorrow. *Impact,* 19: 179-193. See also Carvalho 1969.

Epstein, Joseph. 1965. *The Row Over Urban Renewal.* Harper's. February 1965. p. 55-61.

Esquire. 1968. The June 1968 issue has a series of articles "Cities in Trouble" p. 65-77.

Gavin, J. M. and A. Hadley. 1968. The crisis of the cities: the battle we can win. *Saturday Review,* February 24, 1968. p. 30-34, 57.

Heckscher, August. 1968. Nature and the city. *Natural History,* March 1968, p. 6-10. City parks.

Lowry, W. P. 1967. The climate of cities. *Scientific American,* August 1967, p. 15-23.

Mangin, W. 1967. Squatter settlements. *Scientific American,* October 1967, p. 21-29.

Simon, Arthur R. 1966. New Yorkers without a voice: a tradegy of urban renewal. *Atlantic,* April 1966, p. 54-59.

Spilhaus, A. 1968. The experimental city. *Science,* 159: 710-715.

Tyler, Gus. 1969. Can anyone run a city? *Saturday Review,* November 8, 1969. p. 22-25.

Weissbourd, Bernard and Herbert Channick. 1968. An urban strategy. *Center Magazine,* September 1968, p. 56-65.

2B. Crowding and Aggression

CROWDING AND AGGRESSION/books

Aggression and other abnormal behavior in animals may result from crowding, that is, when the number of individuals exceeds the capacity of the environment to sustain them. Some observers believe that the crowding of man, especially in cities, is one important cause of his antisocial behavior. If this is so, increases in population will be paralleled by increases in antisocial behavior. See also Sections 7 and 11.

Ardrey, R. 1966. *The Territorial Imperative.* Dell. $2.45.

Berkowitz, Leonard. 1962. *Aggression: A Social Psychological Analysis.* New York: McGraw-Hill. $9.50.

Bienen, Henry. 1968. *Violence and Social Change: A Review of Current Literature.* Chicago: University of Chicago Press. $1.25.

Bohannan, Paul. Editor. 1967. *Law and Warfare: Studies in the Anthropology of Conflict.* New York: Doubleday. Natural History Press. $6.95.

Bourne, Peter G. Editor. 1969. *The Psychology and Physiology of Stress with Reference to Special Studies of the Viet Nam War.* New York: Academic Press. $12.00.

Carthy, J. D. and F. J. Ebling. 1964. *The Natural History of Aggression.* New York: Academic Press. $5.00.

Ciba Foundation. 1966. *Conflict in Society.* London: J. & A. Churchill. $13.00.

Fortas, Abe. 1968. *Concerning Dissent and Civil Disobedience.* New York: Signet Books. $0.50.

Fried, Morton, Marvin Harris and Robert Murphy. 1968. *War: The Anthropology of Armed Conflict and Aggression.* Garden City, N.Y.: Natural History Press. $2.95.

Garattini, S. and E. B. Sigg. 1969. *Aggressive Behaviour.* New York: John Wiley. Proceedings of an international symposium.

Graham, Hugh Davis and Ted Robert Gurr. 1969. *Violence in America: Historical and Comparative Perspectives.* Two volumes. A report to the National Commission on the Causes and Prevention of Violence. Washington: U.S. Government Printing Office. $1.25 for Vol. 1, $1.50 for Vol. 2.

Hediger, H. 1961. *The Evolution of Territorial Behavior.* In "Social life of early man". Edited by S. L. Washburn. Viking Fund Publications in Anthropology, No. 31.

Henry, Andrew F. and James F. Short, Jr. 1954. *Suicide and Homicide: Some Economic, Sociological, and Psychological Aspects of Aggression.* New York: Free Press. $1.95.

Hughes, Pennethorne. 1952. *Witchcraft.* Baltimore: Penguin Books. $1.25.

Lewis, Bernard. 1968. *The Assassins: A Radical Sect in Islam.* New York: Basic Books. $5.95. A word for the world.

Lorenz, K. Z. 1966. *On Aggression.* New York: Harcourt, Brace and World. $5.95.

Montagu, M.F.A. Editor. 1968. *Man and Aggression.* New York: Oxford University Press. $1.95.

Morris, D. 1968. *The Naked Ape.* New York: McGraw-Hill. $5.95.

Murray, Margaret. 1921. *Witch Cult in Western Europe.* New York: Oxford University Press. $4.00.

Nieburg, H. L. 1969. *Political Violence. The Behavioral Process.* New York: St. Martin's Press. $5.95. Based on the work done for the U.S. National Commission on the Causes and Prevention of Violence.

Russo, John P. 1964. *The Kaibab North deer herd: Its History, Problems and Management.* Arizona Game and Fish Department. Wildlife Bulletin No. 7.

Scott, John Paul. 1958. *Aggression.* Chicago: Univ. of Chicago Press. $4.50.

Selye, Hans. 1956. *The Stress of Life.* New York: McGraw-Hill. $2.75.

Storr, A. 1968. *Human Aggression.* Atheneum. $5.00.

Tiger, Lionel. 1969. *Men in Groups.* New York: Random House. $5.95.

U. S. Commission on Civil Rights. 1967. *A Time to Listen — A Time to Act. Voices from the Ghettos of the Nation's Cities.* Washington: U.S. Government Printing Office.

U. S. National Commission on the Causes and Prevention of Violence. 1969. *Law and Order Reconsidered.* Washington: U.S. Government Printing Office. $2.50.

U. S. President's Commission on Law Enforcement and Administration of Justice. 1967. *Task Force Report: Science and Technology.* Washington: U.S. Government Printing Office. As related to crime and its control.

U. S. Senate. 1967-1969. Hearings before the Permanent Subcommittee on Investigation of the Committee on Government Operations. *Riots, Civil and Criminal Disorder.* 23 plus parts. Washington: U.S. Government Printing Office.

CROWDING AND AGGRESSION/articles

American Anthropological Association. 1967. War: The anthropology of armed conflict and aggression. *Natural History,* December 1967, p. 39-70. A symposium. Valuable bibliography.

Arendt, Hannah. 1968. Lawlessness is inherent in the uprooted. *New York Times Magazine,* April 28, 1968.

Arendt, Hannah. 1969. Reflections on violence. *New York Review,* 27 February 1969. p. 29-32.

Barr, Stringfellow and others. 1968. Violence and the home of the brave. *Center Magazine,* May 1968, p. 30-36. A symposium on violence in America.

Berkowitz, L. 1964. The effects of observing violence. *Scientific American,* February 1964, p. 35-41.

Berkowitz, Leonard. 1969. Simple views of aggression. *American Scientist,* **57**: 372-383. Evaluations on the books of Ardrey, Lorenz, Montagu, Morris, and Storr.

Calhoun, John B. 1962. Population density and social pathology. *Scientific American,* February 1962, p. 139-148.

Christian, J. J. and D. E. Davis. 1964. Endocrines, behavior, and population. *Science,* **146**: 1550-1560.

Esquire. 1967. The July 1967 issue has a series of articles "On Violence." p. 39-63.

Feibleman, James K. 1966. The ambivalence of aggression and the moralization of man. *Perspectives in Biology and Medicine,* **9**: 537-548.

Gilula, M. F. and D. N. Daniels. 1969. Violence and man's struggle to adapt. *Science,* **164**: 396-405.

Hall, Edward T. 1965. Territorial needs and limits. *Natural History,* December 1965, p. 12-19.

Jacobs, Paul. 1969. The varieties of violence. *The Center Magazine,* January 1969, p. 17-19.

Latane, Bibb and John M. Darley. 1969. Bystander "apathy". *American Scientist,* **57**: 244-268.

Leipzig, Arthur. 1964. Old Africa's "People of the village". *Natural History,* April 1964, 10-19; May 1964, 38-45. A study of a tribe living in an environment remarkably free of noise and strain.

National Academy of Sciences. 1961. Symposium on crowding, stress, and natural selection. *Proceedings National Academy of Sciences,* **47**: 427-464. Papers by C. S. Coon, J. J. Christian, R. L. Snyder, H. L. Ratcliffe, and A.F.C. Wallace.

Rabinowitch, Eugene. 1969. Science and violence. *Bulletin of the Atomic Scientists,* December 1969, p. 2-4, 44.

Trefethen, James B. 1967. The terrible lesson of the Kaibab. *National Wildlife,* June-July 1967, p. 4-9. Overpopulation in deer when the predators are killed.

Wynne-Edwards, V. C. 1965. Self-regulating systems in populations of animals. *Science,* **147**: 1543-1548.

3. AGRICULTURE, FOOD, NUTRITION

AGRICULTURE, FOOD, NUTRITION/books

One of the tragic results of overpopulation is that food in sufficient quality and quantity for the world's population is not available. The references in this section relate not only to the general problems in food production and nutrition but also to studies of what should be done to close the gap between demand and supply of food. See also Sections 1, 2, and 6. References to the role of pesticides in agriculture are in Section 4.

Borgstrom, Georg. 1967. *The Hungry Planet.* New York: Collier Books. $7.95.

Brady, N. C. Editor. 1967. *Agriculture and the Quality of Our Environment.* Washington: American Association for the Advancement of Science. $13.50.

Cantor, Leonard M. 1967. *A World Geography of Irrigation.* Edinburgh: Oliver and Boyd.

Freeman, Orville L. 1968. *Worlds Without Hunger.* New York: Folderick A. Praeger.

Hopcraft, Arthur. 1968. *Born to Hunger.* Boston: Houghton Mifflin. $4.50.

Hutchinson, Joseph. Editor. 1969. *Population and Food Supply.* Cambridge University Press. $4.95.

Janick, Jules, Robert W. Scherg, Frank W. Woods, and Vernon W. Ruttan. 1969. *Plant Science: An Introduction to World Crops.* San Francisco: W. H. Freeman. $12.00.

Kotz, Nick. 1970. *Let Them Eat Promises: The Politics of Hunger in America.* Introduction by Senator George S. McGovern. New York: Prentice-Hall. $6.95.

Mayer, Jean. 1968. *Overweight: Causes, Cost and Control.* Englewood Cliffs, N.J.: Prentice-Hall. $2.45.

Moseman, A. H. Editor. 1964. *Agricultural Sciences for the Developing Nations.* Washington: American Association for the Advancement of Science. $6.75.

Paddock, William and Paul Paddock. 1964. *Hungry Nations.* Boston: Little, Brown.

Paddock, William and Paul Paddock. 1967. *Famine — 1975: America's Decision, Who will Survive.* Boston: Little, Brown. $2.35.

U. S. Department of Agriculture. 1957. *Yearbook for 1957. Soil.* Washington: U.S. Government Printing Office.

U. S. Department of Agriculture. 1959. *Yearbook for 1959. Food.* Washington: U.S. Government Printing Office.

U. S. Department of Agriculture. 1962. *Yearbook for 1962. After a Hundred Years.* Washington: U.S. Government Printing Office.

U. S. Department of Agriculture. 1963. *Yearbook for 1963. A Place to Live.* Washington: U.S. Government Printing Office.

U. S. Department of Agriculture. 1964. *Yearbook for 1964. Farmer's World.* Washington: U.S. Government Printing Office.

U. S. Department of Agriculture. 1966. *Yearbook for 1966. Protecting Our Food.* Washington: U.S. Government Printing Office.

U. S. Department of Agriculture. 1969. *Yearbook for 1969. Food For Us All.* Washington: U.S. Government Printing Office. $3.50.

U. S. House of Representatives. 1968. Hearings before the Committee on Education and Labor. *Malnutrition and Federal Food Service Program.* 2 parts. Washington: U.S. Government Printing Office.

U. S. President's Report on Activities carried out Under Public Law 480---. 1968. *Food for Freedom.* New emphasis on self-help. Washington: U.S. Government Printing Office. The annual report on food for other countries.

U. S. Senate. 1969. Hearings before the Select Committee on Nutrition and Human Needs. *Nutrition and Human Needs.* 13 plus parts. Washington: U.S. Government Printing Office.

Wells, George S. 1969. *Garden in the West: A Dramatic Account of Science in Agriculture.* New York: Dodd, Mead. $5.00.

Williams, Sue Rodwell. 1969. *Nutrition and Diet Therapy.* St. Louis: C. V. Mosby. $8.95. With consideration of the sociological aspects.

Winter, Ruth. 1969. *Poisons in Your Food.* New York: Crown. $5.95. A far from reassuring account of how our food is processed.

AGRICULTURE, FOOD, NUTRITION/articles

Agrawal, Harish. 1968. Revolution in the fields. *New Scientist,* **39**: 438-442. Better wheat in India.

Altschul, A. M. 1967. Food protein: New sources from seeds. *Science,* **158**: 221-226.

Archer, E. James. 1968. Can we prepare for famine? *Bioscience,* **18**: 685-690.

Bardach, J. E. 1968. Aquaculture (husbandry of aquatic animals can contribute increasingly to supplier of high-grade protein food). *Science,* **161**: 1098-1106.

Bawden, Frederick. 1968. Healthier, heavier harvests. *New Scientist,* **39**: 136-138.

Block, M. R. 1963. The social influence of salt. *Scientific American,* July 1963, p. 88-98.

Braidwood, R. J. 1960. The agricultural revolution (the domestication of animals and plants by early man). *Scientific American,* September 1960, p. 130-148.

Brown, L. R. 1967. The world outlook for conventional agriculture. *Science,* **158**: 604-611.

Bunce, G. Edwin. 1969. Milk blindness in Brazil. *Natural History,* February 1969, p. 52-55.

Byerly, T. C. 1967. Efficiency of feed conversion. *Science,* **157**: 890-895.

Bylinsky, Gene. 1969. Improving on nature to vanquish hunger. *Fortune,* April 1969, p. 127-131, 152-156.

Champagnat, A. 1965. Protein from petroleum. *Scientific American,* October 1965, p. 13-17.

Chase, Sherret S. 1968. The vanishing plant breeder: who will expand our food supply? *Bulletin of the Atomic Scientists,* December 1968, p. 10-13.

Chase, Sherret. 1969. Anti-famine strategy: genetic engineering for food. *Bulletin of the Atomic Scientists,* October 1969, p. 2-6.

Chedd, Graham. 1968. The cyclamate saga. *New Scientist,* **40**: 547-549. Damage from these artificial sweeteners.

Chedd, Graham. 1969. Famine or sanity? *New Scientist,* **44**: *178-182. About FAO.*

Cheshire, Paul and John Bowers. 1969. Farming, conservation, and amenity. *New Scientist,* **42**: 13-15. Better nature than marginal farms.

Crawford, M. A. 1968. Are our cows killing us? *New Scientist,* **39**: 16-17. With fats.

Critchfield, Richard. 1969. Feeding the hungry. Can politics keep up with technology. *New Republic,* October 25, 1969, p. 16-19.

Curtis, B. C. and D. R. Johnston. 1969. Hybrid wheat. *Scientific American,* May 1969, p. 21-29.

Darling, F. F. 1960. Wildlife husbandry in Africa. *Scientific American,* November 1960, p. 123-134.

Davis, A. E. and T. D. Bolin. 1969. Milk intolerance in Southeast Asia. *Natural History,* February 1969, p. 54-55.

Drew, Elizabeth B. 1968. Going hungry in America. Government's failure. *Atlantic,* December 1968, p. 53-61.

Duffy, Margaret E. 1969. Penicillin by the pound. *Environment,* October 1969, p. 14-21. Antibiotics in animal feeds.

Dyson-Hudson, N. and R. 1969. Subsistence herding in Uganda. *Scientific American,* February 1969, p. 76-89.

Edelman, Maurice. 1969. Against food pollution. *New Scientist,* November 20, 1969, p. 404-405.

Edelson, Edward. 1968. Food irradiation stymied. *New Scientist,* **38**: 476-477. By F.D.A. (of the U.S.).

Ehrlich, Paul R. 1968. The coming famine. *Natural History,* May 1968, p. 6-15.

Eichenwald, H. F. and P. C. Fry. 1969. Nutrition and learning. *Science,* **163**: 644-648.

Emery, K. O. and C. O'D. Iselin. 1967. Human food from ocean and land. *Science,* **157**: 1279-1281.

Giesinger, E. 1960. The Mediterranean project (about a plan for agricultural rehabilitation). *Scientific American,* July 1960, p. 86-103.

Griliches, Z. 1960. Hybrid corn and the economics of innovation. *Science,* **132**: 275-280.

Hamilton, John A. 1969. The politics of hunger. *Saturday Review,* June 21, 1969. p. 18-21, 87.

Hayes, Alfred. 1969. Mushrooms, microbes and malnutrition. *New Scientist,* 27 November 1969, p. 450-452. A possible source of high quality protein.

Helbaek, H. 1959. Domestication of food plants in the Old World. *Science,* **130**: 365-372.

Hickling, C. F. 1963. The cultivation of Tilapia (a source of protein-rich food). *Scientific American,* May 1963, p. 143-152.

Holt, S. J. 1969. Food resources of the ocean. *Scientific American,* September 1969, p. 178-194.

Isaac, E. 1962. On the domestication of cattle. *Science,* **137**: 195-204.

Jensen, N. F. 1967. Agrobiology: specialization of systems analysis. *Science,* **157**: 1405-1409.

Jones, Bryce. 1968. Science in the larder. *New Scientist,* **38**: 114-117. Food processing.

Kaplan, Martin. 1966. Special effects of animal diseases in developing countries. *Bulletin of the Atomic Scientists,* November 1966, p. 15-21.

King, C. G. 1965. International nutrition programs. *Science,* **147**: 25-29.

Levin, J. H. 1969. Mechanical harvesting of food. *Science,* **166**: 968-974.

McHugh, J. L. 1968. The biologist's place in the fishing industry. *Bioscience,* **18**: 935-939.

McKenzie, John. 1968. Nutrition and the soft sell. *New Scientist,* **40**: 422-424. Problem of making new foods acceptable.

McLaren, A. D. 1963. Biochemistry and soil science. *Science,* **141**: 1141-1147.

McPherson, Archibald T. 1965. Synthetic food for tomorrow's billions. *Bulletin of the Atomic Scientists,* September 1965, p. 6-11.

Mangelsdorf, P. C. et al. 1964. Domestication of corn. *Science,* **143**: 538-545.

Marcus, Judith and Gerald Cohen. 1967. The riddle of the dangerous bean. *Harper's,* June 1967, p. 98-102. About the fava, or broad, bean. Sometimes used for food but a poison to some ethnic groups.

Miller, Derek. 1969. Politics, poverty, and nutrition. *New Scientist,* **44**: 116-119.

National Academy of Sciences. 1966. Symposium on prospects of the world food supply. *Proceedings of the National Academy of Sciences,* **56**: 305-388. Ten papers. Reprint available from the National Academy of Sciences. $1.50.

Phillips, R. W. 1960. Food and Agriculture Organization completes fifteen years. *Science,* **132**: 871-881.

Piel, Gerard. 1968. A world free of want? *Bulletin of the Atomic Scientists,* January 1968, p. 16-22.

Pinchot, G. B. 1966. Whale culture — a proposal. *Perspectives in Biology and Medicine,* **10**: 33-43. Farming the sea.

Pirie, N. W. 1966. Leaf protein as a human food. *Science,* **152**: 1701-1705.

Pirie, N. W. 1967. Orthodox and unorthodox methods of meeting world food needs. *Scientific American,* February 1967, p. 27-35.

Pirie, N. 1968. Food from the forest. *New Scientist,* **40**: 420-422.

Pyke, Magnus. 1969. Food technology and society. *New Scientist,* **42**: 468-469.

Riker, A. J. 1966. Plant pathology and human welfare. *Science,* **152**: 1027-1032.

Robinson, H. F. 1969. Dimensions of the world food crisis. *Bioscience,* **19**: 24-29.

Ryther, John H. 1969. Photosynthesis and fish production in the sea. *Science,* **166**: 72-76.

Schnittker, John A. 1969. The farmer in the till. *Atlantic,* August 1969, p. 43-45.

Schultz, Theodore W. 1968. What ails world agriculture? *Bulletin of the Atomic Scientists,* January 1968, p. 28-35.

Scrimshaw, N. S. 1963. Food. *Scientific American,* September 1963, p. 72-80.

Scrimshaw, N. S. and M. Béhar. 1961. Protein malnutrition in young children. *Science,* **133**: 2039-2047.

Sprague, G. F. 1967. Agricultural production in the developing countries. *Science,* **157**: 774-778.

Thurston, H. David. 1969. Tropical agriculture, a key to world food crises. *Bioscience,* **19**: 29-34.

Waterbolk, H. T. 1968. Food production in prehistoric Europe. *Science,* **162**: 1093-1102.

Wilson, W. O. 1966. Poultry production. *Scientific American,* July 1966, p. 56-64.

4. POLLUTION OF AIR, WATER AND FOOD; PESTICIDES

POLLUTION/books

As man increases in numbers and affluence, so do his waste products. The technology necessary to clothe, feed, house, move, and entertain him has led to a rapid increase in air pollution (from automobiles, heating, industry, and smoking), water pollution (from sewage and industry), and in food pollution (from pesticide residues, radioactive substances, and harmful chemicals). The more advanced the civilization, the greater the garbage. These books and articles deal with many types of pollution of the environment, including a kind that may seem less obvious than the others: excessive noise, which impairs the purity of the air. See also Sections 1, 6, 10, and 11.

Alexander, P. 1965. *Atomic Radiations and Life.* Baltimore: Penguin Books. $1.65.

American Association for the Advancement of Science. 1965. *Air Conservation.* Washington: AAAS Publication No. 80, $8.00.

American Chemical Society. 1969. *Cleaning Our Environment.* The chemical basis for action. Available from American Chemical Society. Special Issues Sales. 1155 Sixteenth Street, N.W., Washington, D.C. 20036.

Calder, R. 1962. *Living with the Atom.* Chicago: University of Chicago Press. $5.95.

Carr, Donald E. 1965. *The Breath of Life.* New York: Norton. $4.95.

Carr, Donald. 1966. *Death of Sweet Waters.* New York: Norton. $5.95.

Carson, Rachel. 1962. *The Silent Spring.* Crest. Fawcett World. $.75. The danger of pesticides described in a forceful manner.

Committee on Environmental Quality of the Federal Council for Science and Technology. 1968. *Noise — Sound Without Value.* Washington: Office of Science and Technology.

Cowan, Edward. 1968. *Oil and Water: The Torrey Canyon Disaster.* Philadelphia: Lippincott. $6.95.

Curtis, Richard and Elizabeth Hogan. 1969. *The Perils of the Peaceful Atom.* New York: Doubleday. $5.95. Radioactive hazards.

DeBach, Paul. Editor. 1964. *Biological Control of Insect Pests and Weeds.* New York: Reinhold. $25.00. Alternatives to pesticides.

Environmental Pollution Panel (PSAC). 1965. *Restoring the Quality of Our Environment.* Washington: U.S. Government Printing Office.

Goldman, Marshall I. Editor. 1967. *Controlling Pollution: The Economics of a Cleaner America.* Englewood Cliffs, N.J. Prentice-Hall. $1.95.

Graham, Frank. 1966. *Disaster by Default: Politics and Water Pollution.* New York: M. Evans.

Grava, Sigurd. 1969. *Urban Planning Aspects of Water Pollution Control.* New York: Columbia University Press. $7.50.

Hanks, Thrift G. 1967. *Solid Waste/Disease Relationships.* Public Health Service Publication No. 999-UIH-6. Washington: U.S. Government Printing Office.

Herfindahl, Orris C. and Allen V. Kneese. 1965. *Quality of the Environment: An Economic Approach to Some Problems in Using Land, Water, and Air.* Baltimore: Johns Hopkins University Press. $2.00.

Hurtig, H. and C. R. Harris. 1968. *The Pollution Reader.* Montreal: Harvest House.

Kneese, Allen V. 1962. *Water Pollution: Economic Aspects and Research Needs.* Baltimore: Johns Hopkins University Press. $1.75.

Miller, M. W. and G. C. Berg. 1969. *Chemical Fallout: Current Research on Persistent Pesticides.* Charles C. Thomas.

National Academy of Sciences. Committee on Pollution. 1966. *Waste Management and Control.* Washington: National Academy of Sciences. Publication 1400.

National Tuberculosis and Respiratory Disease Association. 1969. *Air Pollution Primer.* New York. $1.25.

Novick, Sheldon. 1969. *The Careless Atom.* Boston: Houghton Mifflin. $5.95. A critical review of the program of the Atomic Energy Commission.

Rudd, Robert L. 1966. *Pesticides and the Living Landscape.* Madison: University of Wisconsin Press. $1.95.

U. S. House of Representatives. 1963-1964. Hearings before a Subcommittee of the Committee on Government Operations. *Water Pollution Control and Abatement.* 8 parts. Washington: U.S. Government Printing Office.

U. S. House of Representatives. 1966. Hearings before the Subcommittee on Science, Research, and Development of the Committee on Science and Astronautics. *The Adequacy of Technology for Pollution Abatement.* 2 volumes. Washington: U.S. Government Printing Office.

U. S. House of Representatives. 1969. Hearings before the Committee on Merchant Marine and Fisheries. *Oil Pollution.* Serial 91-4. Washington: U.S. Government Printing Office.

U. S. House of Representatives. 1969. Hearings before the Committee on Public Works. *Federal Water Pollution Control Act Amendments — 1969.* (91-1). Washington: U.S. Government Printing Office.

U. S. Public Health Service. 1965. *Sulfur Oxides and Other Sulfur Compounds. A Bibliography with Abstracts.* Public Health Service Publication No. 1093. Washington: U.S. Government Printing Office. $2.25.

U. S. Public Health Service. 1966. *Carbon Monoxide. A Bibliography with Abstracts.* Public Health Service Publication No. 1503. Washington: U.S. Government Printing Office. $2.50.

U. S. Public Health Service. 1969. *Air Pollution Publications. A Selected Bibliography with Abstracts 1966-1968.* Public Health Service Publication 979. Washington: U.S. Government Printing Office. $4.50. PHS Publication 979 (Revised 1964). Covers 1955-1963. PHS Publication 979 (Revised 1969). Covers 1963-1966.

U. S. Senate. 1969. Hearings before the Subcommittee on Air and Water Pollution of the Committee of Public Works. *Water Pollution.* 4 parts. Serial No. 91-2. Washington: U.S. Government Printing Office.

U. S. Senate. 1963-1964. Hearings before the Subcommittee on Reorganization and International Organizations of the Committee on Government Operations. *Interagency Coordination in Environmental Hazards: Pesticides.* 11 parts. Washington: U.S. Government Printing Office.

POLLUTION/articles

AAAS statement. On the use of herbicides in Vietnam. *Scientist and Citizen,* June – July 1968, p. 118-122.

Anthrop, Donald F. 1969. Environmental Noise Pollution: a new threat to sanity. *Bulletin of the Atomic Scientists,* May 1969, p. 11-16.

Aynsley, Eric. 1969. How air pollution alters weather. *New Scientist,* 44: 66-67.

Bailey, Anthony. 1969. Noise is a slow agent of death. *New York Times Magazine,* 23 November 1969, p. 46 ff.

Barlow, Boris V. 1969. Should we ban the boom? *New Scientist,* 43: 434-436. From Concorde-land.

Barrons, K. C. 1969. Some ecological benefits of woody plant control with herbicides. *Science,* 165: 465-468.

Beranek, L. L. 1966. Noise. *Scientific American,* December 1966, p. 66-76.

Bone, Quentin and N. Holme. 1968. Oil pollution – another point of view. *New Scientist,* 37: 365-366.

Bone, Quentin and N. Holme. 1968. Lessons from the *Torrey Canyon. New Scientist,* 39: 492-493.

Bragdon, Clifford R. 1968. Noise – a syndrome of modern society. *Scientist and Citizen,* March 1968, p. 29-37.

Breidenbach, Andrew W. and Richard W. Eldredge. 1969. Research and development for better solid waste management. *Bioscience,* 19: 984-988.

Brodeur, Paul. 1968. The magic mineral. *New Yorker,* October 12, 1968. p. 117-165. Asbestos.

Brodine, Virginia et al. 1969. The wind from Dugway. *Environment,* January-February 1969, p. 2-9, 40-45. About those sheep in Utah killed by a chemical warfare agent.

Bulletin of the Atomic Scientists. The March 1965 issue has a section "Man and his habitat: problems of pollution", p. 18-30. On pesticides.

Bulletin of the Atomic Scientists. The June 1965 issue has a section: "Man and his habitat: The polluted air." p. 7-25.

Butler, P. A. 1969. Monitoring pesticide pollution. *Bioscience,* 19: 889-891.

Cairns, John. 1968. We're in hot water. *Scientist and Citizen,* October 1968, p. 187-198. The effects of thermal pollution by power plants.

Carr, Donald E. 1966. The death of sweet waters. The politics of pollution. *Atlantic,* May 1966, p. 93-106.

Cheng, T. 1963. Insect control in mainland China. *Science,* 140: 269-277.

Clark, Earl. 1967. How Seattle is beating water pollution. *Harper's,* June 1967, p. 91-95.

Clark, John R. 1969. Thermal pollution and aquatic life. *Scientific American,* March 1969, p. 18-27.

Cohen, Adolph I. et al. 1965. Pesticide Series No. 1. Problems and possibility. *Scientist and Citizen,* April 1965, p. 1-13.

Cole, LaMont C. 1969. Thermal pollution. *Bioscience,* 19: 989-992.

Cole, L. J. and P. C. Nowell. 1965. Radiation carcinogenesis: The sequence of events. *Science,* 150: 1782-1786.

Commoner, Barry. 1968. Nature unbalanced. How man interferes with the nitrogen cycle. *Scientist and Citizen,* January – February 1968, p. 9-19.

Commoner, Barry. 1968. Lake Erie, aging or ill? *Scientist and Citizen,* December 1968, p. 254-265.

Conway, Gordon R. 1969. A consequence of insecticides. *Natural History,* February 1969, p. 46-54. More bugs than before.

Curtis, Richard and Elizabeth Hogan. 1969. The myth of the peaceful atom. *Natural History,* March 1969, p. 6-16, 71-76.

Dixon, J. P. and J. P. Lodge. 1965. Air conservation report reflects national concern. *Science,* 148: 1060-1066.

Dubos, René. 1968. Adapting to pollution. *Scientist and Citizen,* January – February 1968, p. 1-8.

Duggan, R. E. and J. R. Weatherwax. 1967. Dietary intake of pesticide chemicals. *Science,* 157: 1006-1010.

Edwards, C. A. 1969. Soil pollutants and soil animals. *Scientific American,* April 1969, p. 88-99.

Environment. 1969. Poisoning the wells. *Environment,* January-February 1969, p. 16-23, 45. The contamination of well water in California by nitrates.

Evans, David M. and Albert Bradford. 1969. Under the rug. *Environment,* October 1969, p. 3-13, 31. Storing poisonous wastes in deep wells.

Featherstone, Joseph. 1969. The "silent epidemic." *New Republic,* November 8, 1969. p. 13-14. Lead poisoning from paint.

Fermi, Laura. 1969. Cars and air pollution. *Bulletin of the Atomic Scientists,* October 1969, p. 35-37.

Friedlander, Michael W. and Joseph Klarmann. 1969. How many children? *Environment,* December 1969, p. 2-13. An appraisal of Sternglass's study of infant mortality as related to radioactive fallout together with his reply.

Frost, Justin and others. 1969. DDT on balance. A series of articles on that pesticide in *Environment,* July-August 1969, p. 14-40. September 1969, p. 2-17, 28-31, 36-40.

Galston, Arthur W. 1967. Herbicides in Vietnam. *New Republic,* 25 November 1967, p. 19-21.

Goldsmith, J. R. and S. A. Landaw. 1969. Carbon monoxide and human health. *Science,* **162**: 1352-1359.

Gotaas, Harold B. 1969. Outwitting the patient assassin: the human use of lake pollution. *Bulletin of the Atomic Scientists,* May 1969, p. 8-10.

Green, Jr., L. 1967. Energy needs versus environmental pollution. A reconciliation? *Science,* **156**: 1448-1450.

Grinstead, Robert B. 1969. No deposit, no return. *Environment,* November 1969, p. 17-23. Beer cans, plastic bags etc. in nature.

Haagen-Smit, A. J. 1964. The control of air pollution. *Scientific American,* January 1964, p. 24-31.

Hardin, Garrett. 1969. Finding lemonade in Santa Barbara's oil. *Saturday Review,* 10 May 1969, p. 18-21. The diseconomies of pollution.

Harvey, George R. and J. D. Mann. 1968. Picloram in Vietnam. *Scientist and Citizen,* September 1968, p. 165-171.

Healy, J. H. et al. 1968. The Denver earthquakes (disposal of waste fluids by injection into a deep well has triggered earthquakes near Denver, Colorado.) *Science,* **161**: 1301-1310.

Henkin, Harmon. 1969. DDT on trial. *Environment,* March 1969, p. 14-17, 34-36. In Wisconsin.

Hennigan, Robert D. 1969. Water pollution. *Bioscience,* **19**: 976-978.

Higdon, Hal. 1969. Obituary for DDT (in Michigan). *New York Times Magazine,* 6 July 1967, p. 6ff.

Higdon, Hal. 1970. Well, if not DDT, then what? *New York Times Magazine,* 11 January 1970, p. 26 ff. The work of Edward F. Knipling on the biological control of pests.

Hockey, R. and C. Holloway. 1969. Noise and efficiency. *New Scientist,* **42**: 244-248.

Jacobson, M. and M. Beroza. 1964. Insect attractants (substitutes for insecticides). *Scientific American,* August 1964, p. 20-27.

Knipling, E. F. 1960. The eradication of the screw-worm fly. *Scientific American,* October 1970, p. 54-61.

Knipling, E. F. 1965. Pest control: biological methods, specific chemical methods. *Scientist and Citizen,* July 1965, p. 1-8.

Kryter, K. D. 1966. Psychological reactions to aircraft noise. *Science,* **151**: 1346-1355.

Kryter, K. D. 1969. Sonic booms from supersonic transport. *Science,* **163**: 359-367.

Landsberg, Helmut E. 1969. Metropolitan air layers and pollution. *Garden Journal,* March-April 1969. p. 54-57.

Lear, John. 1969. Green light for the smogless car. *Saturday Review,* 6 December 1969, p. 81-86.

Leipzig, Arthur. 1964. Old Africa's "People of the village". *Natural History,* April 1964, 10-19; May 1964, 38-45. A study of a tribe living in an environment remarkably free of noise and strain.

Livingston, Dennis. 1968. Pollution control: An international perspective. *Scientist and Citizen,* September 1968, p. 172-182.

Löfrath, Göran. 1968. Pesticides and catastrophe. *New Scientist,* **40**: 567-568. Even in mother's milk.

Lotspeich, Frederick B. 1969. Water pollution in Alaska: present and future. *Science,* **166**: 1239-1245.

McCaull, Julian. 1969. The black tide. *Environment,* November 1969, p. 2-16, Oil pollution of the oceans.

McDermott, W. 1961. Air pollution and public health. *Scientific American,* October 1961, p. 49-57.

McLean, Louis A. Pesticides and the environment. *Bioscience,* **17**: 613-617.

Mecklin, John M. 1969. It's time to turn down all that noise. *Fortune,* October 1969, p. 130-133, 188-195.

Mellanby, Kenneth. 1969. Can Britain afford to be clean? *New Scientist,* **43**: 648-650.

Mihursky, J. A. 1967. On possible constructive use of thermal additions to estuaries. *Bioscience,* **17**: 698-702.

Morgan, K. Z. 1963. Permissible exposure to ionizing radiation. *Science,* **139**: 565-571.

Nicholson, H. P. 1967. Pesticide pollution control. *Science,* **158**: 871-876.

Niering, William A. 1968. The effects of pesticides. *Bioscience,* **18**: 869-875.

Novick, Sheldon. 1968. The Vietnam herbicide experiment. *Scientist and Citizen,* January-February 1968, p. 20-21.

Novick, Sheldon. 1968. Earthquake and nuclear power. *Scientist and Citizen,* November 1968, p. 230-241.

Novick, Sheldon and others. 1969. A new pollution problem. Also two other articles on mercury poisoning. *Environment,* May 1969, p. 2-23, 43-44.

Pack, D. H. 1964. Meterology of air pollution. *Science,* **146**: 1119-1128.

Panofsky, Hans A. 1969. Air pollution meterology. *American Scientist,* **57**: 269-285.

Paul, Benjamin D. 1961. Fluoridation and the social scientist: a review. *The Journal of Social Ideas,* **17**: 1-12.

Peterson, Malcolm L. 1965. Environmental contamination from nuclear reactors. *Scientist and Citizen,* November 1965, p. 1-11.

Ritchie-Calder, Lord. 1969. Polluting the environment. *Center Magazine,* May 1969, p. 7-12.

Sagan, Leonard A. 1969. Infant mortality controversy: Sternglass and his critics. *Bulletin of the Atomic Scientists,* October 1969, p 26-32.

Salvia, Joseph D. 1968. Milk and pesticides. *Scientist and Citizen,* August 1968, p. 143-153.

Sargent, Frederick. 1967. Adaptive strategy for air pollution. *Bioscience,* **17**: 691-697.

Schaefer, Vincent J. 1969. Some effects of air pollution on our environment. *Bioscience,* **19**: 896-897.

Schrag, Peter. 1969. Life on a dying lake. *Saturday Review,* 20 September 1969, p. 19-21, 55-56. About Lake Erie.

Scientist and Citizen. The April 1968 issue is devoted to lead poisoning. See also the October 1968 issue. p. 199-205.

Scientist and Citizen. Sonic boom in relation to man. November 1968, p. 223-229.

Selikoff, I. J. 1969. Asbestos. *Environment,* March 1969, p. 2-7. The hazards of asbestos dust.

Shea, Kevin P. 1968. Cotton and chemicals. *Scientist and Citizen,* November 1968, p. 209-219.

Snow, Joel A. 1968. Radioactivity from "clean" nuclear power. *Scientist and Citizen,* May 1968, p. 97-101.

Sternglass, Ernest J. 1969. Infant mortality and nuclear test. *Bulletin of the Atomic Scientists,* April 1969, p. 18-20. See also Sagan 1969; Tamplin 1969.

Sternglass, E. J. 1969. Has nuclear testing caused infant deaths? *New Scientist,* **43**: 178-181. From Strontium-90. See also **44**: 14-18.

Swisher, R. D. 1969. Detergent enzymes: biodegradation and environmental acceptability. *Bioscience,* **19**: 1093-1094.

Van Duuren, B. L. 1966. Is cancer airborne? *Scientist and Citizen,* January 1966, p. 1-6. The relation of air pollution to cancer.

Wayman, Cooper H. 1965. A hard look at soft detergents. *Bulletin of the Atomic Scientists,* April 1965, p. 22-26.

Welford, G. A. and W. R. Collins, Jr. 1960. Fallout in New York City during 1958. *Science,* **131**: 1711-1715.

Whitney, Dale. 1966. Sterile flies used to combat Dacus. *Natural History,* March 1966, p. 30-35. An example of the biological control of pests.

Williams, C. M. 1967. Third-generation pesticides. *Scientific American,* July 1967, p. 13-17.

Wilson, Jr., H. A. 1962. Sonic boom. *Scientific American,* January 1962, p. 36-43.

Wolf, Leonard. 1965. Cleaning up the Merrimack. *Bulletin of the Atomic Scientists,* April 1965, p. 16-22.

Wolman, A. 1968. Air pollution: time for appraisal. *Science,* **159**: 1437-1440.

Woodwell, G. M. 1963. The ecological effects of radiation. *Scientific American,* June 1963, p. 40-49.

Woodwell, G. M. 1967. Toxic substances and ecological cycles. *Scientific American,* March 1967, p. 24-31.

Woodwell, G. M. 1967. Radiation and the patterns of nature. *Science,* **156**: 461-470.

Woodwell, George M. 1968. Radioactivity and fallout: the model pollution. *Garden Journal,* July-August 1968, p. 100-104.

Woodwell, G. M. 1969. Radioactivity and fallout: the model pollution. *Bioscience,* **19**: 884-887.

5. MEDICINE, HEALTH, DRUGS

MEDICINE, HEALTH, DRUGS/books

These references largely relate to the sociological aspects of medicine. Refer also to Section 2 for some of the medical aspects of birth control, even though most of the references for this topic are here. In Section 3 there are some references to food and nutrition that are pertinent to health. Section 4, with its references to pollution, also contains references that relate to health. Biological engineering has obvious implications — the references to this topic are in Section 8. And, as always, some of the references in Section 1 will contain relevant material.

Alexander, Franz G. and Sheldon T. Selesnick. 1966. *The History of Psychiatry.* An evaluation of psychiatric thought and practice from prehistoric times to the present. New York: Harper and Row. $11.95.

Anonymous, M.D. 1967. *The Healers.* New York: Putnam. Telling it like it is, I guess, in medicine. $4.95.

Barber, B. 1967. *Drugs and Society.* New York: Russell Sage. $6.50.

Birren, James E. et al. Editors. 1963. *Human Aging.* A biological and behavioral study. Public Health Service Publication No. 986. Washington: U.S. Government Printing Office. $3.00.

Birren, James E. 1959. *Handbook of Aging and the Individual.* Psychological and biological aspects. Chicago: University of Chicago Press. $12.50.

Bloom, Samuel W. 1965. *The Doctor and his Patient.* New York: Free Press. $6.50.

Blum, Richard et al. 1969. *Society and Drugs.* Jossey-Bass. $12.50.

Bryant, John. 1970. *Health and the Developing World.* Ithaca, N.Y.: Cornell University Press. $10.00.

Burrow, James G. 1963. AMA. *Voice of American Medicine.* Baltimore: Johns Hopkins Press. $9.00. For another evaluation of the voice, see Harris 1966.

Ciba Foundation. 1963. *Man and His Future.* London: J. and A. Churchill.

CIBA Foundation. 1964. *Animal Behavior and Drug Action.* Boston: Little, Brown.

Ciba Foundation. 1966. *Immigration: Medical and Social Aspects.* London: J. & A. Churchill. $3.95. Chiefly in reference to the United Kingdom.

Ciba Foundation. 1966. *Ethics in Medical Progress: With Special Reference to Transplantation.* London: J. and A. Churchill. $11.75.

Ciba Foundation. 1967. *Health of Mankind.* London: J. & A. Churchill. $12.00.

Cohen, S. 1969. *The Drug Dilemma.* New York: McGraw-Hill. $1.95. About the mind-active agents.

Comfort, Alexander. 1964. *Aging: The Biology of Senescence.* New York: Holt, Rinehart, and Winston. $9.50.

Cumston, Charles Greene. 1968. *An Introduction to the History of Medicine: From the Time of the Pharaohs to the End of the XVIII Century.* London: Dawsons of Pall Mall. $20.75.

Daedalus. The Spring 1969 issue is devoted to "Ethical Aspects of Experimentation with Human Subjects."

Davis, Fred. Editor. 1966. *The Nursing Profession: Five Sociological Surveys.* New York: John Wiley. $6.95.

Dole, Vincent P. 1969. Ethical aspects and sociological implications of organ transplantation as a therapeutic procedure. *Proceedings National Academy of Sciences,* 63: 1034-1038. Part of a "Symposium on organ transplantation in man". The other papers are of a technical nature.

Dubos, René. 1959. *Mirage of Health.* New York. Doubleday Anchor Books. A splendid discussion of man and his health. $1.25.

Dubos, René. 1965. *Man Adapting.* New Haven: Yale University Press. $2.95.

Dubos, René. 1968. *Man, Medicine and Environment.* New York: Praeger. $4.50.

Fein, Rashi. 1967. *The Doctor Shortage.* Washington: Brookings Institution. $6.00.

Ford, Amasa B. and others. 1967. *The Doctor's Perspective: Physicians View Their Patients and Practice.* Cleveland: Press of Case Western Reserve University. $7.50.

Foucault, Michel. 1965. *Madness and Civilization: A History of Insanity in the Age of Reason.* New York: $5.95. Pantheon Books. In the 17th and 18th centuries.

Freeman, Walter. 1968. *The Psychiatrist: Personalities and Patterns.* New York: $6.75. Grune and Stratton. Outstanding men in the profession.

Gafafer, W. M. Editor. 1964. *Occupational Diseases: A Guide to Their Recognition.* Public Health Service Publication No. 1097. Washington: U.S. Government Printing Office. $2.25.

Galdston, Iago. 1965. *Medicine in Transition.* Chicago: Univ. of Chicago Press. $5.95. The sociology of medicine and public health.

Ginsburg, Sol W. 1963. *A Psychiatrist's Views on Social Issues.* New York: Columbia University Press.

Glass, David C. 1968. *Biology and Behavior: Environmental Influences.* New York: Rockefeller Univ. Press and Russell Sage Foundation. $7.50. The influences of food, social deprivation, social environment on man.

Guthrie, Douglas. 1945. *A History of Medicine.* London: Thomas Nelson.

Haggard, Howard W. 1929. *Devils, Drugs, and Doctors: The Story of the Science of Healing from Medicine-Man to Doctor.* New York: Blue Ribbon Books.

Harris, Richard. 1966. *A Sacred Trust.* New York: New American Library. $1.25. The famous series on the American Medical Association first published in the "New Yorker."

Heiser, Victor. 1936. *An American Doctor's Odyssey.* Adventures in forty-five countries. New York: Norton.

Hertzler, Arther E. 1938. *The Horse and Buggy Doctor.* New York: Harper. Telling it like it was.

Hyde, Margaret O. 1968. *Mind Drugs.* New York: McGraw-Hill. $4.50.

Joyce, C.R.B. Editor. 1968. *Psychopharmacology: Dimensions and Perspectives.* Philadelphia: Lippincott. $10.00.

Joint Commission on Mental Illness and Health. 1961. *Action for Mental Health.* New York: Basic Books. $7.50.

Jones, Kathleen. 1960. *Mental Health and Social Policy: 1845 - 1959.* London: Routledge and Kegan Paul. $6.00.

King, Maurice. Editor. 1966. *Medical Care in Developing Countries.* A primer on the medicine of poverty and a symposium from Makerere. London: Oxford University Press. $4.40.

Kramer, Charles. 1968. *The Negligent Doctor.* New York: Crown Publishers. $5.95.

Lader, Lawrence. 1966. *Abortion.* Boston: Beacon Press. $1.95.

Ladimer, Irving and Roger W. Newman. Editors. 1963. *Clinical Investigations in Medicine: Legal, Ethical, and Moral Aspects.* An anthology and bibliography. Boston: Boston University. Law-Medicine Research Institute.

Lantner, Minna and Gerald Bender. 1969. *Understanding Dentistry.* Boston: Beacon Press. $6.00.

Leighton, Alexander H., John A. Clausen, and Robert N. Wilson. Editors. 1957. *Explorations in Social Psychiatry.* New York: Basic Books.

Loraine, John A. and E. T. Bell. 1968. *Fertility and Contraception in the Human Female.* Edinburgh: E. and S. Livingston. $13.00.

Lowe, David. 1966. *Abortion and the Law.* New York: Pocket Books.

Lowenthal, Marjorie Fiske. 1964. *Lives in Distress: The Paths of the Elderly to the Psychiatric Ward.* New York: Basic Books. $6.95.

Olesen, Virginia L. and Elvi W. Whittaker. 1968. *The Silent Dialogue. A Study in the Social Psychology of Professional Socialization.* San Francisco: Josrey-Bass. $10.00. About nursing.

Oursler, Will. 1968. *Marijuana: The Facts, the Truth.* New York: Paul S. Eriksson. $5.95. As seen by a reporter and writer.

Pappworth, M. H. 1968. *Human Guinea Pigs: Experimentation on Man.* Boston: Beacon Press. $1.95.

Perry, Stewart. 1966. *The Human Nature of Science.* Researchers at work in psychiatry. New York: Free Press. $7.50. A critical view of some of the researchers.

Pincus, G. 1965. *The Control of Fertility.* New York: Academic Press. $9.00. By the father of the pill.

Proger, Samuel. Editor. 1968. *The Medicated Society.* New York: Macmillan. $6.95. Drugs – in the broad sense.

Rayack, Elton. 1967. *Professional Power and American Medicine: The Economics of the American Medical Association.* Cleveland: World Publishing Co. $7.25.

Rosen, George. 1958. *A History of Public Health.* New York: MD Publications. $5.75.

Scott, Robert A. 1969. *The Making of Blind Men: A Study of Adult Socialization.* New York: Russell Sage Foundation. $6.00.

Sigerist, Henry E. 1943. *Civilization and Disease.* University of Chicago Press. Phoenix Books. $1.95.

Singer, Charles and E. Ashworth Underwood. 1962. *A Short History of Medicine.* New York: Oxford University Press. $10.00. In 854 pages.

Smith, David T. Editor. 1967. *Abortion and the Law.* Cleveland: Press of Case Western Reserve University. $7.00.

Solomon, D. 1966. *The Marihuana Papers.* New York: Signet Books. $1.50. Background documents.

Stamp, L. D. 1964. *The Geography of Life and Death.* Ithaca, N.Y.: Cornell University Press. $1.95.

Stecher, P. G. Editor. 1968. *The Merck index of Chemicals and Drugs.* 8th Edition. Rahway, New Jersey: Merck. $15.00. Chemical description, use, medical effects, and human toxicity of all common chemical substances.

Strehler, Bernard Louis. 1962. *Time, Cells, Ageing.* New York: Academic Press.

Strehler, Bernard Louis and others. Editors. 1960. *The Biology of Ageing;* a Symposium held at Gatlinberg, Tennessee, May 1-3, 1957,---. Washington: American Institute of Biological Science. $7.75.

Talland, George A. Editor. 1968. *Human Ageing and Behavior.* New York: Academic Press. $12.00.

Tedeschi, David H. and Ralph E. Tedeschi. 1968. *Importance of Fundamental Principles in Drug Evaluation.* New York: Raven Press. $18.95.

U. S. House of Representatives. 1963. Hearings before a Subcommittee of the Committee on Interstate and Foreign Commerce. *Organization of Public Health Service.* Washington: U.S. Government Printing Office.

U. S. House of Representatives. 1964-1966. Hearings before a Subcommittee of the Committee on Government Operations. *Drug Safety.* 5 parts. Washington: U.S. Government Printing Office.

U. S. House of Representatives. 1965. Executive Hearing before the Committee on Ways and Means. *Medical Care for the Aged.* 2 parts. Washington: U.S. Government Printing Office.

U. S. National Library of Medicine. 1966. *Bibliography of the History of Medicine.* No. 1. 1965. Public Health Service Publication No. 1540. Washington: U.S. Government Printing Office. $1.75.
Ibid. No. 2. 1966. $1.25
Ibid. No. 3. 1967. $2.75

U. S. President's Advisory Commission on Narcotic and Drug Abuse. 1963. *Final Report.* Washington: U.S. Government Printing Office. $0.55.

U. S. President's Commission on the Health Needs of the Nation. 1951. *Building America's Health.* 5 volumes. Washington: U.S. Government Printing Office.

U. S. President's Commission on Heart Disease, Cancer and Stroke. 1964-1965. *A National Program to Conquer Heart Disease, Cancer and Stroke.* 2 volumes. Washington: U.S. Government Printing Office.

U. S. Public Health Service. 1954. *A Bibliography of Occupational Health.* Public Health Service Publication No. 300. Washington: U.S. Government Printing Office. $0.35.

U. S. Public Health Service. 1962-1966. *Health Economics Series.* Six volumes plus. Public Health Service Publication 947.

U. S. Public Health Service. 1965. *Smoking and Health.* Report of the Advisory Committee to the Surgeon General. Public Health Service Publication. No. 1103. Washington: U.S. Government Printing Office. The basic study.

U. S. Public Health Service. 1967. *The Health Consequences of Smoking.* A Public Health Service Review: 1967. Public Health Service Publication No. 1696. Washington: U.S. Government Printing Office. $0.60
1968 Supplement. $0.55.
1969 Supplement. $0.50.

U. S. Public Health Service. 1968. *Bibliography on Smoking and Health.* 1968 cumulation. Public Health Service Publication No. 1124. Washington: U.S. Government Printing Office.
Ibid. 1969 Cumulation.

U. S. Senate. 1964. Hearings before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary. *Physician Ownership in Pharmacies and Drug Companies.* Washington: U.S. Government Printing Office.

U. S. Senate. Committee on Government Operations. 1967. *Research in the Service of Man: Biomedical Knowledge, Development, and Use.* Washington: U.S. Government Printing Office. $.70.

U. S. Senate. 1967. Hearings before the Special Committee on Aging. *Long-range Program and Research Needs in Aging and Related Fields.* Washington: U.S. Government Printing Office.

U. S. Senate. 1968. Hearings before the Subcommittee on Government Research of the Committee on Government Operations. *National Commission on Health Science and Society.* Washington: U.S. Government Printing Office.

U. S. Senate. 1968. Hearings before the Subcommittee on Executive Reorganization of the Committee on Government Operations. *Health Care in America.* 2 parts. Washington: U.S. Government Printing Office.

U. S. Senate. 1968. Hearings before the Committee on Commerce. *Radiation Control for Health and Safety Act of 1967.* 2 parts. Serial No. 90-49. Washington: U.S. Government Printing Office.

U. S. Senate. 1968. Hearings before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary. *Diet Pill Industry.* Washington: U.S. Government Printing Office.

U. S. White House Conference. 1963. *Narcotic and Drug Abuse.* Washington: U.S. Government Printing Office. $1.00.

U. S. White House Conference. 1965. *Health.* Washington: U.S. Government Printing Office. $2.00.

Vail, David J. 1966. *Dehuminization and the Institutional Career.* Springfield: Charles C. Thomas. $10.75. In "mental" hospitals.

Welch, Henry and Felix Marti-Ibañez. Editors. 1956. *The Impact of the Food and Drug Administration on Our Society.* New York: MD Publications.

Williams, Greer. 1969. *The Plague Killers.* New York: Scribner's. $6.95. The Rockefeller Foundation versus yellow fever, malaria, and hookworm.

Zinsser, Hans. 1934. *Rats, Lice and History.* It has been a classic so long that it deserves to be reread. New York. Bantam Books. $.75.

MEDICINE, HEALTH, DRUGS/articles

Allard, Jr., Alexander. 1968. War and disease: an anthropological perspective. *Bulletin of the Atomic Scientists,* June 1968, p. 28-31.

Alvarado, C. A. and L. J. Bruce-Chwatt. 1962. Malaria. *Scientific American,* May 1962, p. 86-98.

Anderson, Fred. 1969. Death and the doctors: who will decide who is to live? *New Republic,* 19 April 1969, p. 9-10.

Atlantic. 1966. The July issue has a special supplement "The trouble with hospitals". p. 87-122.

Attinger, E. O. and H. Millendorfer. 1968. Performance control of biological and societal systems. *Perspectives in Biology and Medicine,* 12: 103-123. The systems approach in public health and other matters.

Aykroyd, W. R. 1968. International health — a retrospective memoir. *Perspectives in Biology and Medicine,* 11: 273-285.

Barber, Bernard. 1967. Experimenting with humans. *The Public Interest,* No. 6: Winter 1967, p. 91-102.

Barber, Bernard. 1968. New ethical procedures in the professions. *Journal of the American Pharmaceutical Association,* NS8: 137-140.

Bard, Bernard and Joseph Fletcher. 1968. The right to die. *Atlantic,* April 1968, p. 59-64.

Barron, F. et al. 1964. The hallucinogenic drugs. *Scientific American,* April 1964, p. 29-37.

Bates, Marston. 1967. Man the drug taker. *Natural History,* January 1967, p. 8-16.

Bean, William B. 1968. The ecology of the soldier in World War II. *Perspectives in Biology and Medicine,* **11**: 675-687. Medical and related problems.

Bearman, Jacob E. and B. W. Brown, Jr. 1967. The relevance of modern clinical trial methodology to the practice of medicine. *Perspectives in Biology and Medicine,* **10**: 259-268.

Beecher, H. K. 1969. Human studies (protection for the investigator and his subject is necessary.) *Science,* **164**: 1256-1258.

Benjamin, Harry and I. B. Pauly. 1969. The maturing science of sex reassignment. *Saturday Review,* 4 Oct. 1969, p. 72-78. From man to woman, and back.

Billingham, R. E. 1966. Tissue transplantation: scope and prospect. *Science,* **153**: 266-270.

Biörck, Gunnar. 1968. Thoughts on life and death. *Perspectives in Biology and Medicine,* **11**: 527-543. From a medical point of view.

Bioscience. The October 1966 issue is devoted almost entirely to drugs.

Bleibtreu, John N. 1966. LSD and the third eye. *Atlantic,* September 1966, p. 64-69.

Bodian, D. 1961. Poliomyelitis immunization. *Science,* **134**: 819-822.

Brown, J.H.U. and James F. Dickson III. 1969. Instrumentation and the delivery of health services. *Science,* **166**: 334-338.

Brown, R. E. 1966. Medical problems of the developing countries. *Science,* **153**: 271-275.

Brown, W.M.C. and others. 1968. Heredity and responsibility. *New Scientist,* **40**: 235-238. Problems raised by XYY males.

Burger, Robert E. 1969. Who cares for the aged? *Saturday Review,* 25 January 1969, p. 14-17.

Bylinsky, Gene. 1969. Biochemical clues to mental illness. *Fortune,* July 1969, p. 124-127, 172-178. Using the mind-influencing drugs.

Cassedy, J. H. 1964. Stimulation of health research. *Science,* **145**: 897-902.

Chang, M. C. 1968. Mammalian sperm, eggs, and control of fertility. *Perspectives in Biology and Medicine,* **11**: 376-383. This is one of a series of articles in the Spring 1968 issue dedicated to Gregory Pincus. Some of the other articles also relate to problems of birth control.

Chedd, Graham. 1968. Cigarettes set the hormones humming. *New Scientist,* **37**: 406-407.

Chedd, Graham. 1968. Tipping the balance in transplant surgery. *New Scientist,* **39**: 122-124.

Cohen, Sidney. 1965. LSD and the anguish of dying. *Harper's,* September 1965, p. 69-78.

Creel, Stephen M. 1966. Our backward medical schools. *Atlantic,* May 1966, p. 46-50.

Dixon, Bernard. 1968. Devaluing a drug. *New Scientist,* **37**: 678-679. By using it for chickens, its usefulness to man might be lessened.

Dixon, Bernard. 1969. Synergistic scourges of man. *New Scientist,* **41**: 226-228. Infection plus malnutrition.

Djerassi, C. 1966. Steroid oral contraceptives. *Science,* **151**: 1055-1061.

Djerassi, C. 1969. Prognosis for the development of new chemical birth-control agents. *Science,* **166**: 468-473.

Drew, Elizabeth B. 1967. The health syndicate. Washington's noble conspirators. *Atlantic,* December 1967, p. 75-82. The lobby that works for more government funds for health research.

Dubos, René. 1966. Man and his environment-biomedical knowledge and social action. *Perspectives in Biology and Medicine,* **9**: 523-536.

Eccles, J. C. 1968. The importance of brain research for the educational, cultural, and scientific future of mankind. *Perspectives in Biology and Medicine,* **12**: 61-68.

Edson, Lee. 1969. The transplantation of the species. *Esquire,* December 1969, p. 169-171, 320-321: Transplantation of organs in man.

Eisenberg, Lucy. 1966. Scientists vs animal lovers: the conflict that never ends. *Harper's,* November 1966, p. 101-110. About the use of live animals in medical research.

Farnsworth, N. R. 1968. Hallucinogenic plants. *Science,* **162**: 1086-1092.

Fishbein, Morris. 1965. History of cancer quackery. *Perspectives in Biology and Medicine,* **8**: 139-166.

Ford, Amasa B. 1970. Casualities of our time. *Science,* **167**: 256-263. Social and technological changes produce new sources of death and disability which raise public issues.

Fox, R. C. 1962. Medical scientists in a chateau. *Science,* **136**: 476-483.

Freedman, Daniel X. 1968. The use and abuse of psychedelic drugs. *Bulletin of the atomic scientists,* April 1968, p. 6-14.

Gardner, J. W. 1965. Health, education and welfare. *Science,* **150**: 1684-1686.

Gardner, J. W. 1966. The government, the universities, and biomedical research. *Science,* **153**: 1601-1603.

Gilgore, S. G. and W. M. O'Brien. 1969. The drug testing debate. *Bulletin of the Atomic Scientists,* June 1969, p. 12-19.

Gilmore, C. P. 1969. Something better than the pill? *New York Times Magazine,* 20 July 1969, p. 6ff.

Goodman, Walter. 1967. Doctors must experiment on humans. *New York Times Magazine,* 2 July 1967, p. 12 ff.

Grant, R. P. et al. 1964. Biomedical science in Europe. *Science,* **146**: 493-501.

Grinspoon, Lester. 1969. Marihuana. *Scientific American,* December 1969, p. 17-25.

Guthrie, R. D. 1967. The ethical relationship between humans and other organisms. *Perspectives in Biology and Medicine,* **11**: 52-62. Vivisection and other matters.

Halberstam, Michael. 1969. The M.D. should not try to cure society. *New York Times Magazine,* 9 November 1969, p. 32 ff. Just people.

Hammond, E. C. 1962. The effects of smoking. *Scientific American,* July 1962, p. 39-51.

Handler, P. 1965. National planning for medical research. *Science,* **148**: 1688-1692.

Hardin, Garrett. 1966. The history and future of birth control. *Perspectives in Biology and Medicine,* **10**: 1-18.

Hatry, Patricia. 1963. The physician's legal responsibility in clinical testing of new drugs. *Clinical Pharmacology and Therapeutics,* **4**: 4-9.

Hinkle, L. E. et al. 1968. Occupation, education, and coronary heart disease. *Science,* **161**: 238-246.

Ingle, D. J. 1968. Judgments in medicine: the assumption of risk. *Perspectives in Biology and Medicine,* **11**: 525-526.

Irwin, S. 1962. Drug screening and evaluative procedures. *Science,* **136**: 123-128.

Irwin, Samuel. 1968. System analysis: A strategy for drug experimentation and evaluation. *Perspectives in Biology and Medicine,* **11**: 654-674.

Ivy, A. C. 1948. The history and ethics of the use of human subjects in medical experiments. *Science,* **108**: 1-5.

Jeffers, W. A. 1965. Our present challenges. *Perspectives in Biology and Medicine,* **9**: 250-257. For medical care.

Ketchel, Melvin M. 1968. Fertility control agents as a possible solution to the world population problem. *Perspectives in Biology and Medicine,* **11**: 687-703.

Langer, W. L. 1964. The black death. *Scientific American,* February 1964, p. 114-121.

Larner, Jeremy. 1965. The young drug addict: can we help him? *Atlantic,* February 1965, p. 75-80.

Lasagna, L. 1964. Problems of drug development. *Science,* **145**: 362-367.

Lasagna, Louis. 1968. Caution on the pill. *Saturday Review,* 2 November 1968, p. 64-69.

Lasagna, Louis. 1969. The pharmaceutical revolution: its impact on science and society. *Science,* **166**: 1227-1233.

Leaf, A. 1968. Government, medical research, and education. *Science,* **159**: 604-607.

Lear, John. 1968. Transplanting the heart. *Saturday Review,* 6 January 1968, p. 98-101.

Lear, John. 1968. A realistic look at heart transplants. *Saturday Review,* 3 February 1968, p. 53-60.

Lear, John. 1969. New facts on fluoridation. *Saturday Review,* 1 March 1969, p. 51-56. (see also Stare 1969, Lederberg 1969).

Lear, John. 1969. Fluoridation and the physician. *Saturday Review,* 7 June 1969, p. 58.

Lederberg, J. 1969. We need more research. *Saturday Review,* 3 May 1969, p. 60. On fluoridation.

Lessing, Lawrence. 1969. The life-saving promise of enzymes. *Fortune,* March 1969, p. 119-121, 147-152.

Linder, F. E. 1966. The health of the American people. *Scientific American,* June 1966, p. 21-29.

Lindsay, D. R. and E. M. Allen. 1961. Medical research: past support, future directions. *Science,* **134**: 2017-2024.

Lisk, D. J. 1966. Detection and measurement of pesticide residues. *Science,* **154**: 93-98.

McDermott, W. et al. 1960. Introducing modern medicine in a Navajo community. *Science,* **131**: 197-205; 280-287.

McElroy, William D. 1969. Biomedical aspects of population control. *Bioscience,* **19**: 19-23.

Maren, T. H. 1968. Pharmacology: its nature in medicine. *Science,* **161**: 443-444.

Mayer, J. and D. W. Thomas. 1967. Regulation of food intake and obesity. *Science,* **156**: 328-337.

Michaelson, Michael G. 1969. Medical students: healers become activists. *Saturday Review,* 16 August 1969, p. 41-43, 53-54.

Mills, D. H. 1964. Malpractice and the clinical laboratory. *Science,* **144**: 638-642.

Mitchison, Avrion and others. 1968. The heart of the matter. *New Scientist,* **37**: 121-126. Heart transplants.

Modell, W. 1963. Hazards of new drugs. *Science,* **139**: 1180-1185.

Modell, W. 1967. Mass drug catastrophes and the roles of science and technology. *Science,* **156**: 346-351.

Modell, W. 1968. Malaria and victory in Vietnam. *Science,* **162**: 1346-1352.

Morris, A. C. and R. C. Greulich. 1968. Dental research: the past two decades. *Science,* **160**: 1081-1088.

Morris, K.R.S. 1960. New frontiers to health in Africa. *Science,* **132**: 652-658.

National Academy of Sciences. On heart transplants. *Saturday Review,* 6 April 1968, p. 59. Some suggested rules.

Neel, James V. 1967. Some genetic aspects of therapeutic abortion. *Perspectives in Biology and Medicine,* **11**: 129-135.

New Scientist. 1968. A bitter reckoning. *New Scientist,* **37**: 14-15. Uncritical use of antibiotics.

Nichols, J. R. 1965. How opiates change behavior. *Scientific American,* February 1965, p. 80-88.

O'Brien, William M. 1969. Drug testing: is time running out. *Bulletin of the Atomic Scientists,* January 1969, p. 8-14.

Peterson, O. L. 1963. Medical care in the U.S. *Scientific American,* August 1963, p. 19-27.

Pincus, G. 1966. Control of conception by hormonal steroids. *Science,* **153**: 493-500.

Piore, N. K. 1965. Metropolitan medical economics. *Scientific American,* January 1965, p. 19-27.

Ratner, Herbert and Donald McDonald. 1969. Second edition/ Medicine in America. *Center Magazine,* May 1969, p. 19-26.

Ratnoff, Oscar and Marian Ratnoff. 1967. Ethical responsibilities in clinical investigation. *Perspectives in Biology and Medicine,* **11**: 82-90.

Ribicoff, Abraham. 1965. The dangerous ones: help for children with twisted minds. *Harper's,* February 1965, p. 88-90.

Roberts, Catherine. 1964. The use of animals in medical research. *Perspectives in Biology and Medicine,* **8**: 106-120.

Rogers, E. S. 1968. Public health asks for sociology. *Science,* **159**: 506-508.

Rossi, Ennio C. 1965. Why is the medical profession estimable in the individual but not in the generality? *Perspectives in Biology and Medicine,* **8**: 230-240.

Rous, P. 1967. The challenge to man of the neoplastic cell. *Science,* **157**: 24-28.

Russell, C. Scott. 1969. Another hazard of smoking. *New Scientist,* **41**: 64-65. To unborn babies.

Ryder, N. B. and C. F. Westoff. 1966. Use of oral contraception in the United States. *Science,* **153**: 1199-1205.

Sabin, A. B. 1967. Collaboration for accelerating progress in medical research. *Science,* **156**: 1568-1571.

Sapolsky, H. M. 1968. Science, voters, and the fluoridation controversy. *Science,* **162**: 427-433.

Schalie, Henry van der and C. J. Shiff. 1969. Schistosomiasis. *Natural History,* February 1969, p. 62-67.

Schultes, R. E. 1969. Hallucinogens of plant origin. *Science,* **163**: 245-254.

Schur, Edwin M. 1966. Psychiatrists under attack. The rebellious Dr. Szasz. *Atlantic,* June 1966, p. 72-76.

Sinrod, H. S. 1965. Peridontal disease in developing nations. *Science,* **149**: 400-402.

Stare, F. J. et al. 1969. Fluoridation and "new facts". *Saturday Review,* 3 May 1969, p. 57-59.

Stewart, William H. 1967. Medical education and the community. *Perspectives in Biology and Medicine,* **10**: 462-467.

Stewart, William H. 1968. New dimensions of health planning. *Perspectives in Biology and Medicine,* **11**: 195-202.

Stock, Robert W. 1968. The XYY and the criminal. *New York Times Magazine,* 20 October 1968, p. 30ff.

Tamplin, Arthur R. 1969. Fetal and infant mortality and the environment. *Bulletin of the Atomic Scientists,* December 1969, p. 23-34.

Taussig, H. B. 1962. The Thalidomide syndrome. *Scientific American,* August 1962, p. 29-35.

Taylor, C. E. 1966. Ethics for an international health profession. *Science,* **153**: 716-720.

Tietze, C. and S. Lewit. 1969. Abortion. *Scientific American,* January 1969, p. 21-27.

Veith, Ilza. 1967. Medicare in utopia. *Perspectives in Biology and Medicine,* **11**: 91-110.

Viorst, M. 1964. The political good fortune of medical research. *Science,* **144**: 267-270.

Walford, Roy L. 1967. A matter of life and death. *Atlantic,* August 1967, p. 65-70. Medical and ethical problems associated with organ transplants.

Wedge, B. 1967. Psychiatry and international affairs. *Science,* **167**: 281-285.

Weeks, J. R. 1964. Experimental narcotic addiction. *Scientific American,* March 1964, p. 46-52.

Weil, A. T. et al. 1968. Clinical and psychological effects of marihuana in man. *Science,* **162**: 1234-1242.

Weinberg, Alvin W. 1965. Scientific choice and biomedical science. *Minerva,* **4**: 3-14.

Williams, G. 1966. Quality versus quantity in American medical education. *Science,* **153**: 956-961.

Wolfenberger, W. 1967. Ethical issues in research with human subjects. *Sciences,* **155**: 47-51.

Wood, Clive. 1969. The early years of the IUD. *New Scientist,* **42**: 413-415.

Wynder, E. L. and D. Hoffmann. 1968. Experimental tobacco carcinogenesis. *Science,* **162**: 862-871.

Zbinden, G. 1969. Drug safety: experimental programs. *Science,* **164**: 643-647.

6. NATURAL RESOURCES, CONSERVATION

NATURAL RESOURCES, CONSERVATION/books

Natural resources are the products of nature used by man. They can be consumed by him (air, food, water, etc.), employed in his technology (minerals, forests, water, air, etc.), used by him for homes, factories, transportation, waste disposal (land, rivers, oceans, air, etc.), or just enjoyed (natural areas for rest, recreation, and health). Population size and affluence are directly related to the demands for natural resources and to the rate of their destruction. Problems of conservation of natural resources are more general than is indicated by the references in this section. Refer especially to Section 4, where questions of pollution of natural resources are considered, and to Section 10 as well. An excellent introduction to the field is the National Academy of Sciences' (1969) "Resources and Man." Conservation of natural resources will be such an important task for man throughout the foreseeable future that some special remarks are in order.

Conservation. During this century enormous strides have been made in this country in preserving areas of great natural beauty where wildlife is protected. National Parks, National Seashores, National Monuments, Wilderness Areas, National Wildlife Refuges, as well as similar state and local preserves are under the protection of governmental agencies. In these areas nature has, at least in theory, equal rights with man.

As population increases, the demand for living space, cultivated land, and the exploitation of natural resources will also increase. Thus, conservationists must intensify their efforts if natural areas are to be protected and expanded. If you wish to support such efforts, there are many organizations you may join. Two prominent ones are The Sierra Club (1050 Mills Tower, San Francisco, California 94104. Annual membership $17.00 the first year; thereafter $12.00) and the National Parks Association (1701 18th Street, N.W., Washington, D.C. 20009. Annual membership $6.50). Members of each receive an informative and most attractive magazine.

As our population becomes more urbanized, another problem is becoming increasingly more obvious: many city children have no familiarity with nature. When one's first-hand experience with the animal kingdom includes little besides pigeons, starlings, rats, mice, and roaches, and the only familiar plants are those springing from tiny circles in concrete, it is difficult to develop much appreciation of nature — a state that must be reached before one wishes to conserve nature.

Why should a person raised in a city wish to support National Parks? Teachers and others interested in conservation have an increasing responsibility for showing students that wild nature is important. Carefully planned field trips and visits to museums, zoological gardens, and botanical gardens will help. And do not overlook books, such as those published by the Sierra Club (listed below). These have outstanding photographs that carry the message: it is worthwhile to preserve nature. Some students might respond to the written message: try Kieran (1957) or Terry and Renny Russell.

Archer, Sellers G. 1956. *Soil Conservation.* Norman: University of Oklahoma Press. $4.95.

Barnett, Harold J. and Chandler Morse. 1963. *Scarcity and Growth: The Economics of Natural Resource Availability.* Baltimore: Johns Hopkins University Press. $5.50.

Black, John D. 1968. *Management and Conservation of Biological Resources.* Philadelphia: F. A. Davis. $7.50.

Butcher, Devereux. 1969. *Exploring our National Parks and Monuments.* Sixth Edition. Boston: Houghton Mifflin. $8.95.

Cahn, Robert. 1968. *Will Success Spoil the National Parks.* Boston: The Christian Science Publishing Society. $1.00. Based on an excellent series that appeared in "The Christian Science Monitor."

Chorley, Richard J. Editor. 1969. *Water, Earth, and Man: A Synthesis of Hydrology, Geomorphology, and Socio-Economic Geography.* London: Methuen (In U.S.A. Barner and Noble). $2.50.

Ciriacy-Wantrup, S. V. 1968. *Resource Conservation: Economics and Policies.* Berkeley: Univ. of California. Division of Agriculture Sciences. $4.00.

Ciriacy-Wantrup, S. V. and James J. Parsons. 1967. *Natural Resources: Quality and Quantity.* Berkeley: University of California Press. $6.50. Fourteen papers on as many aspects of natural resources.

Clawson, Marion and Burnell Held. 1957. *The Federal Lands: Their Use and Management.* Baltimore: Johns Hopkins University Press. $8.50.

Clawson, Marion et al. 1960. *Land for the Future.* Baltimore: Johns Hopkins University Press. $8.50.

Cox, George W. 1969. *Readings in Conservation Ecology.* New York: Appleton-Century-Crofts. $4.95. An anthology.

Dasmann, Raymond. 1965. *The Destruction of California.* New York: MacMillan. Paperback $1.50.

Douglas, W. O. 1965. *A Wilderness Bill of Rights.* Boston: Little Brown. $1.95.

Ekirch, Arthur A. 1963. *Man and Nature in America.* New York: Columbia University Press. $5.75.

Ewald, William R. 1967. *Environment for Man: The Next Fifty Years.* Bloomington, Indiana: Indiana University Press. $2.95.

Fisher, James, Noel Simon and Jack Vincent. 1969. *Wildlife in Danger.* New York: Viking. $12.95. A catalogue, with fine illustrations.

Fisher, Joseph L. and Neal Potter. 1964. *World Prospects for Natural Resources: Some Projections of Demand and Indicators of Supply to the Year 2000.* Baltimore: Johns Hopkins University Press. $1.50.

Frank, Bernard and Anthony Netboy. 1950. *Water, Land, and People.* New York: Knopf.

Grossman, Mary Louise, S. Grossman and J. H. Hamlet. 1969. *Our Vanishing Wilderness.* New York: Grosset and Dunlap. $14.95. Excellent illustrations.

Guthrie, John A. and George R. Armstrong. 1961. *Western Forest Industry: An Economic Outlook.* Baltimore: Johns Hopkins University Press. $6.50.

Hay, John. 1969. *In Defense of Nature.* Boston: Little, Brown. $4.95. The author explains why wild nature is an esthetic necessity for him.

Ise, John. 1961. *Our National Park Policy: A Critical History.* Baltimore: Johns Hopkins University Press. $10.00.

Jarrett, Henry. Editor. 1958. *Perspectives on Conservation: Essays on America's Natural Resources.* Baltimore: Johns Hopkins University Press. $5.00.

Jarrett, Henry. Editor. 1959. *Science and Resources: Prospects and Implications of Technological Advance.* Baltimore: Johns Hopkins University Press. $5.00.

Jarrett, Henry. Editor. 1961. *Comparisons in Resource Management: Six Notable Programs in Other Countries and Their Possible U.S. Application.* Baltimore: Johns Hopkins University Press. $5.50.

Kaufman, Herbert. 1960. *The Forest Ranger: A Study in Administrative Behavior.* Baltimore: Johns Hopkins University Press. $5.00.

Kieran, John. Editor. 1957. *Treasury of Great Nature Writing.* New York: Doubleday.

Kneese, Allen V. 1964. *The Economics of Regional Water Quality Management.* Baltimore: Johns Hopkins Univ. Press. $5.00.

Landsberg, Hans H. 1964. *Natural Resources for U.S. Growth: A Look Ahead to the Year 2000.* Baltimore: Johns Hopkins Press. $2.45.

Landsberg, Hans H., Leonard L. Fischmann, and Joseph L. Fisher. 1963. *Resources in America's Future: Patterns of Requirements and Availabilities, 1960 – 2000.* Baltimore: Johns Hopkins University Press. $15.00. Landsberg 1964 is a condensed version.

Leigh-Pemberton, John. 1968. *Vanishing Wild Animals of the World.* New York: Franklin Watts. $7.95.

Leopold, A. 1966. *A Sand County Almanac.* New York: Oxford University Press. $6.50. Ecological Ethics.

Leydet, Francois. 1964. *The Last Redwoods, and The Parkland of Redwood Creek.* San Francisco: Sierra Club. $8.50.

Little, Charles E. 1968. *Challenge of the Land.* New York: Open Space Action Institute. $3.75. The planned use of space.

Lyles, Charles H. 1968. *Fishery Statistics of the United States.* 1966. Statistical Digest 60. Bureau of Commercial Fisheries. Washington: U.S. Government Printing Office.

McDivitt, James F. 1965. *Minerals and Men: An Exploration of the World of Minerals and its Effect on the World We Live In.* Baltimore: Johns Hopkins Univ. Press. $1.95.

McGuinness, C. L. 1963. *The Role of Ground Water in the National Water Situation.* Washington: U.S. Geological Survey Water Supply paper 1800.

Marx, Wesley. 1967. *The Frail Ocean.* New York: Ballentine Books. $.95.

Matthiessen, Peter. 1959. *Wildlife in America.* New York: The Viking Press. $1.95.

Murphy, Robert. 1968. *Wild Sanctuaries: Our National Wildlife Refuges, a Heritage Restored.* New York: E. P. Dutton. $22.50.

Nash, Roderick. 1967. *Wilderness and the American Mind.* New Haven: Yale University Press. $1.95.

National Academy of Sciences. 1969. *Resources and Man.* A study and recommendations by the Committee on Resources and Man. San Francisco: W. H. Freeman, $2.95.

Netboy, Anthony. 1968. *The Atlantic Salmon: A Vanishing Species.* Boston. Houghton Mifflin. $6.95. A species endangered by pollution.

Netschert, Bruce C. 1958. *The Future Supply of Oil and Gas.* Baltimore: Johns Hopkins University Press. $3.00.

Osborn, Fairfield. 1948. *Our Plundered Planet.* Boston: Little, Brown. $1.95.

Ostrom, Vincent. 1953. *Water and Politics: A Study of Water Policies and Administration in the Development of Los Angeles.* Los Angeles: The Haynes Foundation.

Popkin, Roy. 1968. *Desalination: Water for Mankind's Future.* New York: Praeger. $5.95.

Potter, Neal and Francis T. Christy, Jr. 1962. *Trends in Natural Resource Commodities: Statistics of Prices, Output, Consumption, Foreign Trade, and Employment in the United States, 1870 – 1957.* Baltimore: Johns Hopkins University Press. $17.50.

Roueché, Berton. 1968. *What's Left: Reports on a Diminishing America.* Boston: Little, Brown. $5.95. A skilled and sensitive writer tells what's left, in narrative form.

Russell, Terry and Renny Russell. *On the Loose.* San Francisco: Sierra Club. $3.95.

Schurr, Sam H. et al. 1960. *Energy in the American Economy, 1850 – 1975.* Baltimore: Johns Hopkins University Press. $12.50.

Schwartz, William. Editor. 1969. *Voices for the Wilderness.* New York: Ballantine. $1.25. Key papers from the Sierra Club Wilderness Conferences.

Sears, Paul B. 1935. *Deserts on the March.* Norman, Oklahoma: University of Oklahoma Press. $3.75.

Scientific American. The September 1969 issue is devoted to "Oceans."

Sierra Club Exhibit Format Series. San Francisco: Sierra Club.
This is the American Earth. Ansel Adams and Nancy Newhall. $3.95.
Words of the Earth. Cedric Wright. $15.00.
In the Wildness Is the Preservation of the World. Eliot Porter. $25.00.
The Place No One Knew: Glen Canyon on the Colorado. Eliot Porter. $25.00.

The Eloquent Light. Ansel Adams.
Time and the River Flowing: Grand Canyon. Francois Leydet. $25.00.
Gentle Wilderness: the Sierra Nevada. Richard Kauffman.
Not Man Apart. Ansel Adams and others.
Everest: The Wild Ridge. Thomas Hornbein. $25.00.
Summer Island: Penobscot Country. Eliot Porter. $3.95.
Navajo Wildlands. Phylip Hyde. $3.95.
Kauai, and the Park Country of Hawaii. Robert Wenkam. $3.95.
Glacier Bay. Dave Bohn. $25.00.
Baja California. Eliot Porter. $3.95.
Central Park Country. Nancy and Retta Johnston.
Galapagos: the Flow of Wildness. Eliot Porter. $45.00.

Sierra Club. Wilderness Conference Books. San Francisco: Sierra Club. (See also Schwartz, 1969)
Wilderness and the Quality of Life (Tenth Conference.)
Wilderness in a Changing World (Ninth Conference.)
Tomorrow's Wilderness (Eighth Conference.) $5.75.
Wilderness: America's Living Heritage (Seventh Conference.) $5.75.
The Meaning of Wilderness to Science (Sixth Conference.) $5.75.
Wildlands in Our Civilization (Fifth Conference, with highlights of the first four conferences.)

Smith, Frank E. 1966. *The Politics of Conservation.* New York: Pantheon Books (Random House). $5.95.

Soil Conservation Society of America. 1966. *Water and America's Future.* Ankeny, Iowa: Soil Conservation Society of America. $5.00.

Soil Conservation Society of America. 1967. *Soil and America's Future.* Ankeny, Iowa: Soil Conservation Society of America. $5.00.

Soil Conservation Society of America. 1968. *Creative Conservation for Life and Living.* Ankeny, Iowa: Soil Conservation Society of America. $5.00.

Teal, John and Mildred Teal. 1969. *Life and Death of the Salt Marsh.* Boston: Little Brown. $7.95. These uniquely important habitats are in danger.

Thomas, H. E. 1951. *The Conservation of Ground Water.* New York: McGraw-Hill.

Tilden, Freeman. 1968. *National Parks.* New York: Knopf. $1.50.

Udall, S. L. 1963. *The Quiet Crisis.* New York: Avon Books. $.95. A former Secretary of the Interior on conservation.

U. S. Department of Agriculture. 1955. Yearbook for 1955. *Water.* Washington: U.S. Government Printing Office.

U. S. Department of Agriculture. 1958. Yearbook for 1958. *Land.* Washington: U.S. Government Printing Office.

U. S. Department of Agriculture. 1967. *Outdoors U.S.A.* Washington: U.S. Government Printing Office.

U. S. Department of Agriculture. Forest Service. 1958. *Timber Resources for America's Future.* Forest Resource Report No. 14. Washington: U.S. Government Printing Office. $7.00.

U. S. Department of Agriculture. Forest Service. 1965. *Timber Trends in the United States.* Forest Resource Report No. 17. Washington: U.S. Government Printing Office. $1.75.

U. S. Department of the Interior. 1964. *Waterfowl for Tomorrow.* Washington: U.S. Government Printing Office. $4.00.

U. S. Department of the Interior. 1967. *Proceedings of the First International Symposium on Water Desalination.* 3 volumes. Washington: U.S. Government Printing Office. $11.00 set.

U. S. Department of the Interior (1969?). *United States Petroleum Through 1980.*

U. S. Department of Interior Conservation Yearbooks.
No. 1. *Quest for Quality.* 1965. $1.00.
No. 2. *The Population Challenge: What It Means to Americans.* 1966. $1.25.
No. 3. *The Third Wave: America's New Conservation.* 1967. $2.00.
No. 4. *Man: An Endangered Species.* 1968. $1.50.
No. 5. *It's Your World: The Grassroots Conservation Story.* 1969. $2.00.

U. S. House of Representatives. 1962. Hearings before the Subcommittee on Public Lands of the Committee on Interior and Insular Affairs. *Wilderness Preservation System.* Serial No. 12, 4 parts. *Ibid* 1964. Serial Number 15, 4 parts. Washington: U.S. Government Printing Office.

U. S. House of Representatives. 1965. Hearings before the Subcommittee on Roads of the Committee on Public Works. *Highway beautification.* (89-17). Washington: U.S. Government Printing Office.

U. S. House of Representatives. 1969. Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries. *Endangered Species.* Serial 91-2. Washington: U.S. Government Printing Office.

U. S. House of Representatives. 1969. Hearings before the Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs. *Saline Water Conversion Program — 1970.* Washington: U.S. Government Printing Office.

U. S. Outdoor Recreation Resources Review Commission. 1962. *Outdoor Recreation for America.* Washington: U.S. Government Printing Office. $2.00.

U. S. President's Council on Recreation and Natural Beauty. 1966. *A Proposed Program for Scenic Roads and Parkways,* Washington: U.S. Government Printing Office. $2.75.

U. S. President's Council on Recreation and Natural Beauty. 1968. *From Sea to Shining Sea.* A report on the American environment — our Natural Heritage. Washington: U.S. Government Printing Office. $2.50. Excellent bibliography.

U. S. President's Materials Policy Commission. 1952. *Resources for Freedom.* 5 volumes. Washington: U.S. Government Printing Office.

U. S. Senate. 1961. Hearings before the Committee on Interior and Insular Affairs. *The Wilderness Act. Ibid,* 1967, Wild and Scenic Rivers. Washington: U.S. Government Printing Office.

U. S. Senate. 1966. Hearings before the Committee on Interior and Insular Affairs. *North Cascades — Olympic National Park.* Washington: U.S. Government Printing Office.

U. S. Senate. 1966. Hearings before the Subcommittee on Water and Power Resources of the Committee on Interior and Insular Affairs. *Weather Modification.* Washington: U.S. Government Printing Office.

U. S. Senate. 1967. Hearings before the Subcommittee on Parks and Recreation of the Committee on Interior and Insular Affairs. *The North Cascades. Ibid.* 1966. *Redwood National Park.* 2 parts; *Ibid* 1967. Redwood National Park. Washington: U.S. Government Printing Office.

U. S. Water Resources Council. 1968. *The Nation's Water Resources.* Washington: U.S. Government Printing Office. $4.25. A summary report for $0.65.

U. S. White House Conference. 1963. *Conservation.* Washington: U.S. Government Printing Office. $1.00.

U. S. White House Conference. 1965. *Beauty for America.* Washington: U.S. Government Printing Office. $2.75. Of nature, not girls.

Wagner, Philip. 1960. *The Human Use of the Earth.* New York: Macmillan. $1.95.

Wolman, Abel. 1969. *Water, Health and Society.* Bloomington: Indiana University Press. $15.00.

NATURAL RESOURCES, CONSERVATION/articles

Ambroggi, R. P. 1966. Water under the Sahara. *Scientific American,* May 1966, p. 21-29.

Bradley, C. C. 1962. Human water needs and water use in America. *Science,* **138**: 489-491.

Brooks, Paul. 1965. The plot to drown Alaska. *Atlantic,* May 1965, p. 53-59. The effects of a dam in the wilderness.

Clawson, M. et al. 1969. Desalted seawater for agriculture: is it economic. *Science,* **164**: 1141-1148.

Colwell, R. N. 1968. Remote sensing of natural resources. *Scientific American,* January 1968, p. 54-69.

Cooper, C. F. 1961. The ecology of fire. *Scientific American,* April 1961, p. 150-160.

Darnell, Rezneat and others. 1968. Symposium: the role of the biologist in preservation of the biotic environment. *Bioscience,* **18**: 383-424. Ten articles.

Davis, George H. 1964. Management of water in arid lands. *Natural History,* August - September 1964, p. 26-33.

Erickson, Paul A. and John T. Reynolds. 1969. The ecology of a reservoir. *Natural History,* November 1969, p. 48-53.

Flawn, P. T. 1966. Geology and the new conservation movement. *Science,* **151**: 409-412.

Ford, Brian J. 1969. Industrial dereliction and Britain's beauty. *New Scientist,* **43**: 428-429.

Gerasimov, Innokenti P. 1969. A Soviet plan for nature. *Natural History,* December 1969, p. 24-35.

Goodwin, Richard H. 1967. The future role of the biologist in protecting our natural resources. *Bioscience,* **17**: 161-165.

Grzimek, Bernhard. 1961. The last great herds of Africa. *Natural History,* January 1961, p. 8-21.

Halliday, W. R. and A. M. Woodbury. 1961. Protection of Rainbow Bridge National Monument. *Science,* **133**: 1572-1583.

Hartesveldt, Richard J. 1964. Fire ecology of the giant sequoias. *Natural History,* December 1964, p. 12-19.

Hartley, Harold and others. 1969. Energy for the world's technology. *New Scientist,* 13 November 1969, p. 1-24. Five articles.

Hasler, Arthur D. and Bruce Ingersoll. 1968. Dwindling lakes. *Natural History,* November 1968, p. 8-19. Eutrophication.

Hassler, A. D. 1969. Cultural eutrophication is reversible. *Bioscience,* **19**: 425-431. How to clean up polluted lakes.

Hellman, R. A. 1967. Wildlife conservation in Uganda in relation to economic development. *Bioscience,* **17**: 608-612.

Hibbard, Jr., W. R. 1968. Mineral resources: challenge or threat? *Science,* **160**: 143-149.

Hickman, K. 1966. Oases for the future. *Science,* **154**: 612-617.

Hillaby, John. 1968. Seals, scientists, and stalemate. *New Scientist,* **37**: 140-143. Attempts at conservation — of seals. See also **37**: 413-414.

Hillaby, John. 1968. Seals, scientists and sentiment: *New Scientist,* **38**: 75-77.

Hillaby, John. 1968. The wind, the white man and the caribou. *New Scientist,* **38**: 222-224. Caribou conservation.

Hillaby, John. 1968. Genocide at sea. *New Scientist,* **39**: 38. Whales.

Hillaby, John. 1968. Primate overkill. *New Scientist,* **40**: 93.

Hogarton, J. F. 1968. The arrival of nuclear power. *Scientific American,* February 1968, p. 21-31.

Hope, Jack. 1968. Prosperity and the national parks. *Natural History,* February 1968, p. 6-23.

Hope, Jack. 1968. The king besieged. *Natural History,* November 1968, p. 52-56, 72-82. The controversy over plans for Walt Disney Productions to develop a recreation center that would destroy some wild areas in the Sierras of California.

Iltis, Hugh H. 1967. To the taxonomist are ecologists whose fight is the preservation of nature. *Bioscience,* **17**: 886-890.

Judson, Sheldon. 1968. Erosion of the land — or what's happening to our continents? *American Scientist,* **56**: 356-374.

Kalinin, G. P. and V. D. Bykov. 1969. The world's water resources, present and future. *Impact,* **19**: 135-150.

Kesteven, G. L. 1968. A policy for conservationists. *Science,* **160**: 857-860.

Kilburn, Paul D. 1961. Endangered relic trees. *Natural History,* December 1961, p. 56-63. In the western U.S.

Kimball, Thomas L. 1969. Our national EQ. The first National Wildlife Federation index of environmental quality. *National Wildlife,* August-September 1969, p. 3-13.

Kneese, Allen V. 1965. New directions in water management. *Bulletin of the Atomic Scientists,* May 1965, p. 2-8.

Kranzer, Herman G. and others. 1968. Conflicts in conservation. *Bioscience,* **18**: 855-875. A symposium.

LaMer, V. K. and T. W. Healy. 1965. Evaporation of water: its retardation by monolayers. *Science,* **148**: 36-42.

Lear, John. 1969. The pulse of earth. *Saturday Review,* 1 Feb. 1969, p. 49-52. Resources from the sea.

Leopold, Luna B. 1969. Landscape esthetics. *Natural History,* October 1969, p. 36-45.

Lewis, Richard S. 1965. NAWAPA: water for the year 2000. *Bulletin of the Atomic Scientists,* May 1965, p. 9-11. Plans to drain the water from Canada to the U.S. and Mexico.

Lowdermilk, W. C. 1960. The reclamation of a man-made desert. *Scientific American,* March 1960, p. 54-63.

Lowenethal, David. 1968. Daniel Boone is dead. *Natural History,* August - September 1968, p. 8-16, 64-67. Sorry to hear that but, in the mean time, there is plenty of not-so-wild nature to enjoy.

Lutz, H. J. 1963. Forest ecosystems: their maintenance, ameloriation, and deterioration. *Journal of Forestry,* **61**: 563-569.

McHugh, J. L. 1969. The United States and world whale resources. *Bioscience,* **19**: 1075-1078.

McVay, S. 1966. The last of the great whales. *Scientific American,* August 1966, p. 13-21.

Malone, T. F. 1967. Weather modification: implications of the new horizons in research. *Science,* **156**: 897-901.

Martin, John Stuart. 1965. Rebirth of the shad. *Atlantic,* June 1965, p. 90-93. The happy tale of a fish that seems to be holding on to grim life.

Martin, Paul S. 1967. Pleistocene overkill. *Natural History,* December 1967, p. 32-38. A suggestion that man, not nature, was responsible for the extinction of many mammals in the Pleistocene.

Maxwell, John C. 1965. Will there be enough water? *American Scientist,* **53**: 97-103.

Meyerhoff, H. A. 1962. Mineral raw materials in the national economy. *Science,* **135**: 510-516.

Mikesell, M. W. 1960. Deforestation in Northern Morocco. *Science,* **132**: 441-448.

Moment, Gairdner B. 1968. Bears: the need for new sanity in wildlife conservation. *Bioscience,* **18**: 1105-1108. People are injured and killed by bears.

Murphy, R. C. 1962. Antarctic conservation. *Science,* **135**: 194-197.

Nace, Raymond L. 1964. Water of the world. *Natural History,* January 1964, p. 10-19.

Nace, Raymond L. 1969. Arrogance toward the landscape: A problem in water planning. *Bulletin of the Atomic Scientists,* December 1969, p. 11-14.

Netboy, Anthony. 1967. Melancholy fate of Salmo Salar. *Natural History,* June-July 1967, p. 52-59.

Pell, Claiborne. 1969. The oceans: Man's last great resource. *Saturday Review,* 11 October 1969, p. 19-21, 62-63.

Revelle, R. 1963. Water resources research in the Federal Government. *Sciences,* **142**: 1027-1033.

Revelle, R. 1963. Water. *Scientific American,* September 1963, p. 92-108.

Schneider, William J. 1966. Water and the everglades. *Natural History,* November 1966, p. 32-41.

Scudder, Thayer. 1960. Environment and a culture. *Natural History,* April 1960, p. 6-17; May 1960, p. 24-31. Transplanting people to prepare for the Kariba Dam.

Scudder, Thayer. 1965. The Kariba Case: man made lakes and resource development in Africa. *Bulletin of the Atomic Scientists,* December 1965, p. 6-11. Dam first and think later.

Scudder, Thayer. 1969. Kariba Dam. The ecological hazards of making a lake. *Natural History,* February 1969, p. 68-72.

Sewell, W. R. Derrick and others. 1967. NAWAPA: A continental water system. *Bulletin of the Atomic Scientists,* September 1967, p. 9-27. Plans for diverting using the water of North America.

Stone, E. C. 1965. Preserving vegetation in parks and wilderness. *Science,* **150**: 1261-1267.

Stone, E. C. and R. B. Vasey. 1968. Preservation of coast redwood alluvial flats. *Science,* **159**: 157-161.

Taylor, George C. 1965. Water, history, and the Indus Plain. *Natural History,* May 1965, p. 40-49. Danger from improper irrigation.

Thomas, Harold E. 1965. Reality of drought is always with us. *Natural History,* November 1965, p. 50-57.

Thomas, H. E. and L. B. Leopold. 1964. Ground water in North America. *Science,* **143**: 1001-1006.

Thompson, W. F. 1965. Fishing treaties and salmon of the North Pacific. *Science,* **150**: 1786-1789.

Tinker, Jon. 1969. Marrying wildlife to forestry. *New Scientist,* **42**: 518-520.

Topp, Robert W. 1969. Interoceanic sea-level canal: effects on the fish faunas. *Science,* **165**: 1324-1327.

Waller, Robert. 1969. Conservation agriculture. *New Scientist,* **42**: 179-181.

Wilhm, J. L. and T. C. Dorris. 1968. Biological parameters for water quality criteria. *Bioscience,* **18**: 477-481.

7. RACE

RACE/books

Included here are references to the biological aspects of race, racial differences, and some of the sociological consequences of race. Other pertinent references will be found in Sections 1, 2A, especially 2B, and 11.

Barzun, Jacques. 1965. *Race: A Study in Superstition.* New York: Harper Torchbooks. $1.95.

Bloom, Benjamin. 1964. *Stability and Change in Human Characteristics.* New York: Wiley.

Boyd, W. C. 1950. *Genetics and the Races of Man.* Boston: Little, Brown.

Brink, W. and L. Harris. 1967. *Black and White: A Study of U.S. Racial Attitudes Today.* New York. Simon and Schuster. $1.95.

Ciba Foundation. 1967. *Caste and Race: Comparative Approaches.* London: J. & A. Churchill. $12.00. Throughout the world and throughout history.

Clark, Kenneth B. 1965. *Dark Ghetto: Dilemmas of Social Power.* New York: Harper and Row. $1.75.

Clark, Kenneth B. 1968. *The Negro and the Urban Crisis.* In "Agenda for the Nation." Edited by Kermit Gordon. Washington: The Brookings Institute.

Coon, Carleton S. 1962. *The Origin of Races.* New York: Knopf. $7.50. See Van Valen 1966, Race-Articles.

Daedalus. The Spring 1961 issue is devoted to "Ethnic groups in American life."

Daedalus. The Spring 1967 issue is devoted to "Color and Race." See Franklin, 1968.

Deutsch, M., I. Katz, and A. Jensen. 1968. *Social Class, Race, and Psychological Development.* New York: Holt, Rinehart, and Winston. $7.95.

Dohrenwend, Bruce P. and Barbara S. Dohrenwend. 1969. *Social Status and Psychological Disorder: A Casual Inquiry.* New York: Wiley-Interscience. $9.50. Some consideration of race.

Franklin, John Hope. Editor. 1968. *Color and Race.* Boston: Houghton Mifflin. $6.95. Based on the Spring 1967 issue of *Daedalus.*

Glock, C. Y. and E. Siegelman. 1969. *Prejudice U.S.A.* New York: Praeger. $2.25.

Grier, William H. and Price M. Cobbs. 1968. *Black Rage.* New York: Bantam Books. $5.95. Two black psychiatrists describe the feelings of black Americans.

Levi-Strauss, Claude. 1967. *The Savage Mind.* University of Chicago Press. $3.25.

Mann, Ida. 1966. *Culture, Race, Climate and Eye Disease.* Springfield: Charles C. Thomas. $21.00.

Marx, Gary T. 1967. *Protest and Prejudice: A Study of Belief in the Black Community.* New York: Harper and Row. $8.95.

Mead, Margaret, Th. Dobzhansky, E. Tobach and Robert E. Light. Editors. 1968. *Science and the Concept of Race.* New York. Columbia University Press. $2.50.

Meade, J. E. and A. S. Parker. 1966. *Genetic and Environmental Factors in Human Ability.* New York: Plenum Press.

Myrdal, Gunnar. 1962. *An American Dilemma.* Two volumes. New York. Harper Torchbooks. $7.90. (see Arnold Rose 1964).

National Advisory Commission on Civil Disorders. Report. ("Kerner Report"). New York: Bantam Books. $1.25.

National Advisory Commission on Civil Disorders. Supplemental Studies. ("Kerner Report".) Washington. U.S. Government Printing Office. $1.50.

Opler, Marvin K. Editor. 1959. *Culture and Mental Health.* New York: Macmillan. $9.50.

Parsons, T. and K. B. Clark. Editors. 1966. *The Negro American.* Boston. Houghton Mifflin. $9.50.

Pixley, Dick. 1968. *The Closed Question: Race Relations in Britain Today.* London. Geoffrey Chapman.

Rose, Arnold. 1964. *The Negro in America.* The condensed version of Gunnar Myrdal's "An American Dilemma". New York: Harper Torchbook. $2.25.

Rose, Peter I. 1968. *The Subject is Race: Traditional Ideologies and the Teaching of Race Relations.* New York: Oxford University Press. $1.50.

Selznick, Gertrude J. and Stephen Steinberg. 1969. *The Tenacity of Prejudice: Anti-Semitism in Contemporary America.* New York: Harper and Row. $8.95.

U. S. Commission on Civil Rights. 1967. *Racial Isolation in Public Schools.* Volume 1. Washington: U.S. Government Printing Office. $1.00. There is also a volume of "Appendices". $1.00.

Vandenberg, Steven G. Editor. 1968. *Progress in Human Behavior Genetics. Recent Reports of Genetic Syndromes, Twin Studies, and Statistical Advances.* Baltimore: Johns Hopkins Press. $12.50.

RACE/articles

AAAS Committee. 1963. Science and the race problem. *Science,* 142: 558-561.

Ashmore, Harry S. 1968. Black power and white inertia. *Center Magazine,* January 1968, p. 55-60.

Atlantic. October 1967 issue has section entitled: "Black Ghettos: The American Nightmare". p. 97-110.

Boyce, A. J. and others. 1968. Race, rhyme and reason. *New Scientist,* **39**: 128-130, 188-190, 245-247.

Boyd, W. C. 1963. Genetics and the human race. *Science,* **140**: 1057-1064.

Burt, Cyril. 1969. Intelligence and heredity. *New Scientist,* **42**: 226-228.

Caplan, N. S. and J. M. Paige. 1968. A study of ghetto rioters. *Scientific American,* August 1968, p. 15-21.

Case, James. 1969. Race and intelligence. *Saturday Review,* 17 May 1969, p. 67-68. (Comments on Jensen 1969.)

Comer, J. P. 1967. The social power of the negro. *Scientific American,* April 1967, p. 21-27.

Degler, Carl N. 1969. The negro in America – where Myrdal went wrong. *New York Times Magazine,* 7 December 1969, p. 64 ff.

Dobzhansky, Th. 1962. Genetics and equality. *Science,* **137**: 112-115.

Eysenck, Hans. 1969. A critique of Jensen. *New Scientist,* **42**: 228-229.

Farb, Peter. 1968. The American indian: a portrait in limbo. *Saturday Review,* 12 October 1968, p. 26-29.

Farley, R. and K. E. Taeuber. 1968. Population trends in residential segregation since 1960. *Science,* **159**: 953-956.

Ferry, W. H. and others. 1968. The racial crisis. *Center Magazine,* March 1968. p. 34-48.

Goslin, D. A. 1968. Standardized ability tests and testing. *Science,* **159**: 851-855.

Hyman, H. H. and P. B. Sheatslay. 1964. Attitudes on desegregation. *Scientific American,* July 1964, p. 16-23.

Ingle, D. J. 1964. Racial differences and the future. *Science,* **146**: 375-379.

Ingle, Dwight J. 1965. The 1964 UNESCO proposals on the biological aspects of race: a critique. *Perspectives in Biology and Medicine,* **8**: 403-408.

Ingle, Dwight J. 1967. The need to study biological differences among racial groups. Moral issues. *Perspectives in Biology and Medicine,* **10**: 497-499.

Irvine, Sidney. 1969. Culture and mental ability. *New Scientist,* **42**: 230-231. An *in situ* study of Africans.

Jencks, Christopher. 1969. A reappraisal of the most controversial educational document of our times. *New York Times Magazine,* 10 August 1969, p. 12 ff. The Coleman Report.

Jencks, Christopher. 1969. What color is IQ? intelligence and race. *New Republic,* 13 September 1969, p. 25-29.

Jensen, Arthur R. 1969. How much can we boost IQ and scholastic achievement? Harvard Educational Review. Winter 1969 p. 1-123. The most recent major study purporting to demonstrate racial differences in IQ. Not unexpectedly, a vigorous battle of words has ensued. See for example, The Spring 1969 and Summer 1969 issues of the *Harvard Educational Review* and, in addition, Case 1969; Voyat 1969; Jencks 1969; Burt 1969; Eysenck 1969. See next entry.

Jensen, Arthur R. and others. 1969. Environment, heredity, and intelligence. *Harvard Educational Review.* Reprint Series No. 2, $4.95. Jensen's article and the reactions to it.

Jensen, Arthur R. 1969. An embattled hypothesis. An interview with Arthur R. Jensen. *Center Magazine,* September 1969, p. 77-80.

Lowe, Jeanne R. 1969. Race, jobs, and cities: what business can do. *Saturday Review,* 11 January 1969, p. 27-30, 91-92.

Milgram, S. 1961. Nationality and conformity. *Scientific American,* December 1961, p. 45-51.

Reed, T. E. 1969. Caucasian genes in American negroes. *Science,* **165**: 762-768.

Rodman, H. 1968. Family and social pathology in the ghetto. *Science,* **161**: 756-762.

Rokeach, M. and L. Mezei. 1966. Race and shared belief as factors in social choice. *Science,* **151**: 167-172.

Rosenthal, R. and L. F. Jacobson. 1968. Teacher expectations for the disadvantaged child. *Scientific American,* April 1968, p. 19-23.

Srinvas, M. N. and A. Béteille. 1965. The "untouchables" of India. *Scientific American,* December 1965, p. 13-17.

Stern, Curt. 1967. Genes and people. *Perspectives in Biology and Medicine,* **10**: 500-523.

Taeuber, K. E. 1965. Residential segregation. *Scientific American,* August 1965, p. 12-19.

Van Valen, Leigh. 1966. On discussing human races. *Perspectives in Biology and Medicine,* **9**: 377-383. About Coon 1962 (Race-Books) and his critics.

Voyat, Gilbert. 1969. IQ: God-given or man-made? *Saturday Review,* 17 May 1969, p. 73-75, 86-87 (comments on Jensen 1969.)

Warkov, Seymour and Andrew M. Greeley. 1966. Parochial school origins and educational achievement. *American Sociological Review,* **31**: 406-414.

Zabel, William D. 1965. Interracial marriage and the law. *Atlantic,* October 1965, p. 75-79.

8. BIOLOGICAL ENGINEERING, EUGENICS

BIOLOGICAL ENGINEERING, EUGENICS/books

Man has been extraordinarily successful in applying biological engineering to many plants and animals. He can develop varieties that are beautiful, strong, nutritious, sociable, swift, tasty, large, colorful, small, docile, fierce, or that combine several of the agreed-upon virtues. These changes for the good suggest that similar desirable results would ensue if genetic knowledge were applied to the human species. Such notions of controlled breeding were widely discussed in the early years of this century when the science of genetics was developing rapidly. The recent dramatic discoveries in molecular biology have opened up new possibilities: some day it may be possible to more directly manipulate the hereditary material. But the important question is, of course, "who will be the engineer?" See also Section 5.

Augenstein, Leroy G. 1968. *Come, Let Us Play God.* New York: Harper and Row. $4.95. Genetic manipulation.

Medawar, P. B. 1959. *The Future of Man.* New York: A Mentor Book. $0.60. Speculations on the genetic qualities of future generations of mankind.

Muller, Herman J. 1968. *On Genetic Aberrations and Human Genetic Betterment.* In "Talks with scientists", edited by Charles Madden. Carbondale: Southern Illinois Univ. Press.

Roslansky, John D. Editor. 1965. *Genetics and the Future of Man.* New York: Appleton-Century-Crofts. $5.00. A discussion at the first Nobel Conference.

Sonneborn, T. M. Editor. 1965. *The Control of Human Heredity and Evolution.* New York: Macmillan.

Taylor, G. R. 1968. *The Biological Time Bomb.* New York: World. $5.50. Sex, mind, death, genetic engineering.

Wolstenholme, Gordon. Editor. 1963. *Man and His Future.* London: Churchill. A Ciba Foundation conference. $6.00.

BIOLOGICAL ENGINEERING, EUGENICS/articles

Benjamin, Harry and I. B. Pauly. 1969. The maturing science of sex reassignment. *Saturday Review,* 4 October 1969, p. 72-78. Changing men into women, and the reverse.

Dubos, René. 1969. Lasting biological effects of early influences. *Perspectives in Biology and Medicine,* **12**: 479-491.

Ebling, John. 1968. Decreasing male influence. *New Scientist,* **37**: 185-187. Hormones and criminals.

Edwards, Robert and Richard Gardner. 1968. Choosing sex before birth. *New Scientist,* **38**: 218-220. Most choose it later, too.

Eisenberg, Lucy. 1966. Genetics and the survival of the unfit. *Harpers,* February 1966, p. 53-58.

Fleming, Donald. 1969. On living in a biological revolution. *Atlantic,* February 1969, p. 64-70. See also *Atlantic,* March 1969, p. 46-47.

Lederberg, Joshua. 1966. Experimental genetics and human evolution. *Bulletin of the Atomic Scientist,* October 1966, p. 4-11.

Luria, S. E. 1969. Modern biology; a terrifying power. *Nation,* 20 October 1969, p. 406-409.

Muller, H. J. 1961. Human evolution by voluntary choice of germ plasm. *Science,* **134**: 643-649.

Muller, H. J. 1968. What genetic course will man steer? *Bulletin of the Atomic Scientist,* March 1968, p. 6-12.

Ornstein, Leonard. 1967. The population explosion, conservative eugenics, and human evolution. *Bioscience,* **17**: 461-464.

Saturday Review. 1969. Behavioral science or electioneering. *Saturday Review,* 1 November 1969, p. 65-67. Account of a study by the National Academy of Sciences that included topics in the area of biological engineering.

Sinsheimer, Robert L. 1969. The prospect for designed genetic change. *American Scientist,* **57**: 134-142.

Stern, Curt. 1967. Genes and people. *Perspectives in Biology and Medicine,* **10**: 500-523.

Weye, Nathaniel. 1968. Some possible genetic implications of Carthaginian child sacrifice. *Perspectives in Biology and Medicine,* **12**: 69-78.

Williams, Roger J. 1969. Heredity, human understanding, and civilization. *American Scientist,* **57**: 237-243.

Zigler, E. 1967. Familial mental retardation. *Science,* **155**: 292-298.

9. THE NATURE OF SCIENCE AND SCIENTISTS

SCIENCE AND SCIENTISTS/books

These references are concerned with the nature of science and scientists — science as an enterprise and scientists as individuals. The references that relate science and scientists more directly to society are in Section 10. There is much overlap between Sections 9 and 10, however. See also Section 1.

Bridgman, P. W. 1927. *The Logic of Modern Physics.* New York: Macmillan.

Bronowski, J. 1953. *The Common Sense of Science.* New York: Vintage. $3.50.

Bronowski, J. 1965. *Science and Human Values.* New York: Harper Torchbook. $1.25.

Butterfield, Herbert. 1957. *The Origins of Modern Science.* New York: Free Press. Macmillan. $1.95.

Cox, Donald W. 1964. *America's New Policy Makers: The Scientists Rise to Power.* Philadelphia: Chilton.

Crombie, A. C. 1959. *Medieval and Early Modern Science.* Volume I. *Science in the Middle Ages: V-XIII Centuries.* Volume II. *Science in the Late Middle Ages and Early Modern Times: XIII-XVII Centuries.* Garden City, New York: Doubleday Anchor Books. $.95 per volume.

Crosson, Frederick J. Editor. 1967. *Science and Contemporary Society.* Notre Dame: University of Notre Dame Press. $7.95. Ten essays dealing with science and literature, philosophy, religion, international affairs, human welfare, education, and man's future.

DeGrazia, Alfred. Editor. 1966. *The Velikovsky Affair: The Welfare of Science and Scientism.* New Hyde Park, N.Y.: University Books.

Eiduson, Bernice T. 1962. *Scientists: Their Psychological World.* New York: Basic Books. $6.50.

Feigl, Herbert and Grover Maxwell. Editors. 1961. *Current Issues in the Philosophy of Science.* New York: Holt, Rinehart and Winston. $7.95. Proceedings of several AAAS symposia.

Glaser, Barney G. 1964. *Organizational Scientists: Their Professional Careers.* Indianapolis: Bobbs-Merrill. $1.95.

Glass, Bentley. 1965. *Science and Ethical Values.* Chapel Hill: Univ. of North Carolina Press. $1.45.

Gruber, Howard E. and others. Editors. 1962. *Contemporary Approaches to Creative Thinking.* New York: Atherton Press. $6.95.

Hagstrom, Warren O. 1965. *The Scientific Community.* New York: Basic Books. $7.50.

Hanson, Norwood Russell. 1958. *Patterns of Discovery. An Enquiry into the Conceptual Foundations of Science.* Cambridge University Press. $1.95.

Hawkins, David. 1964. *The Language of Nature: An Essay in the Philosophy of Science.* San Francisco: W. H. Freeman. $1.95.

Hill, Karl. Editor. 1964. *The Management of Scientists.* Beacon Press. $4.95.

Hirsch, Walter and George K. Zollschan. 1964. *Explorations in Social Change.* "Knowledge, Power, and Social Change." Boston: Houghton, Mifflin. $12.50.

Klaw, Spencer. 1968. *The New Brahmins: Scientific Life in America.* New York. Morrow. $6.50. A newspaper and magazine writer reports on the life style of the scientists.

Koestler, Arthur. 1964. *The Act of Creation.* New York: Macmillan. $1.95.

Kuhn, Thomas S. 1962. *The Structure of Scientific Revolutions.* Chicago: University of Chicago Press. $1.50.

Lapp, Ralph E. 1965. *The New Priesthood: The Scientific Elite and the Uses of Power.* New York: Harper and Row. $4.45.

Obler, Paul C. and Herman A. Estrin. Editors. 1962. *The New Scientist: Essays on Methods and Values of Modern Science.* Garden City, New York: Doubleday-Anchor. $1.45.

Madden, Charles. Editor. 1968. *Talks with Scientists.* Carbondale: Southern Illinois Univ. Press. $5.85.

Medawar, P. B. 1967. *The Art of the Soluble.* London: Methuen. $4.00.

Moody, E. Prior. 1962. *Science and the Humanities.* Evanston, Illinois: Northwestern University Press.

Nagel, E. 1961. *The Structure of Science.* New York: Harcourt, Brace & World. $10.75.

Northrup, F.S.C. 1948. *The Logic of Science and the Humanities.* New York: Meridian. $2.95.

Price, D. J. de Solla. 1963. *Little Science, Big Science.* New York: Columbia University Press. $1.25. The growth of science.

Price, Don K. 1965. *The Scientific Estate.* Cambridge: Harvard University Press. $6.50.

Roe, Anne. 1953. *The Making of a Scientist.* New York: Dodd, Mead. $1.75.

Shapere, D. 1965. *Philosophical Problems of the Natural Science.* New York: Macmillan. $1.75.

Stern, Philip M. 1970. *The Oppenheimer Case. Security on Trial.* New York: Harper and Row. $10.00. Galileo revisited?

Stratton, Julius Adams. 1966. *Science and the Educated Man.* Cambridge, Mass: Mass. Institute of Technology Press. $5.00. Personal observations on scientists by the president of M.I.T.

Strauss, Anselm and Lee Rainwater. 1962. *The Professional Scientist: A Study of American Chemists.* Chicago: Aldine Publishing Co. $6.75.

Torrance, Thomas F. 1969. *Theological Science.* London: Oxford University Press. Chapters 2, 3, and 6 discuss the relation of theology to science.

Vavoulis, A. and A. W. Colver. Editors. 1966. *Science and Society: Selected Essays.* San Francisco: Holden-Day. $2.50. Largely about the nature of science.

Von Frisch, Karl. 1967. *A Biologist Remembers.* New York: Pergamon. $7.00. The autobiography of a German biologist who devoted his life to the study of behavior.

Weinberg, A. M. 1967. *Reflections on Big Science.* Cambridge. MIT Press. $1.95.

Woolf, Harry. Editor. 1964. *Science as a Cultural Force.* Baltimore: Johns Hopkins Press. $4.50. Essay by Woolf, Killian, Wiesner, Polanyi, and Holton.

SCIENCE AND SCIENTISTS/articles

Abelson, P. H. 1964. Trends in scientific research. *Science,* **143**: 218-223.

Adams, J. B. 1965. Magaloscience. *Science,* **148**: 1560-1564.

Ayala, Francisco J. 1968. Biology as an autonomous science. *American Scientist,* **56**: 207-221.

Barber, B. 1961. Resistance by scientists to scientific discovery. *Science,* **134**: 596-602.

Barber, Bernard. 1963. Tension and accommodations between science and humanism. *American Behavioral Scientist,* **7**: 3-8.

Basalla, G. 1967. The spread of western science. *Science,* **156**: 611-622.

Beardslee, D. C. and D. D. O'Dowd. 1961. The college-student image of the scientist. *Science,* **133**: 997-1001.

Ben-David, Joseph. 1964. Scientific growth: a sociological view. *Minerva,* **2**: 455-476.

Bereano, Philip L. 1969. The scientific community and the crisis of belief. *American Scientist,* **57**: 484-501.

Bethe, Hans. 1968. Second edition/Hans Bethe on Science. *Center Magazine,* March 1968, p. 66-70.

Bochner, S. 1963. Revolutions in physics and crises in mathematics. *Science,* **141**: 408-411.

Bonnett, André M. 1968. Science: the antithesic of creativity. *Perspectives in Biology and Medicine,* **11**: 233-246.

Booker. H. G. 1964. Academic organization in physical science. *Science,* **146**: 35-37.

Boring, E. G. 1964. Cognitive dissonance: its use in science. *Science,* **145**: 680-685.

Bragg, L. 1966. The art of talking about science. *Science,* **154**: 1613-1616.

Brain, W. R. 1965. Science and antiscience. *Science,* **148**: 192-198.

Butterfield, H. 1960. The scientific revolution. *Scientific American,* September 1960, p. 173-192.

Caspari, E. W. and R. E. Marshak. 1965. The rise and fall of Lysenko. *Science,* **149**: 275-278.

Caws, Peter. 1969. The structure of discovery. *Science,* **166**: 1375-1380. Scientific discovery is no less logical than deduction.

Conklin, E. G. 1968. Early days at Woods Hole and M.B.L. stories. *American Scientist,* **56**: 112-129.

Cook, L. G. and G. W. Hazzard. 1965. Mature research institution and the older scientist. *Science,* **150**: 716-719.

Cowan, T. A. 1963. Decision theory in law, science, and technology. *Science,* **140**: 1065-1075.

Cranberg, Lawrence. 1965. Ethical problems of scientists. *Educational Record,* Summer 1965, p. 282-296.

Crowther, J. G. 1969. The strategy of science. *New Scientist,* **42**: 304-305. Planning for science's future.

Crane, Diana. 1965. Scientists at major and minor universities: a study of productivity and recognition. *American Sociological Review,* **30**: 699-714.

Dedijer, S. 1962. Measuring the growth of science. *Science,* **138**: 781-788.

Dedijer, Stevan. 1963. Underdeveloped science in underdeveloped countries. *Minerva,* **2**: 61-81.

DeLeon, Benjamin. 1968. Is science morally sterile? *Bulletin of the Atomic Scientists,* May 1968, p. 54-55.

Dixon, Bernard. 1968. The way some scientists talk---. *New Scientist,* **38**: 73-74. By gobbledegooking.

Dyson, F. J. 1965. Death of a project. *Science,* **149**: 141-144.

Efron, Robert. 1967. Biology without consequences. *Perspectives in Biology and Medicine,* **11**: 9-36. Reductionism and other matters.

Eiduson, Bernice T. 1966. Productivity rate in research scientists. *American Scientist,* **54**: 56-63.

Eisenhart, C. 1968. Expression of the uncertainties of final results. *Science,* **160**: 1201-1204.

Ferdinand, Theodore N. 1966. On the obsolescence rate of scientists and engineers. *American Scientist,* **54**: 46-56.

Fleming, Donald. 1966. Nobel's hits and errors. *Atlantic,* October 1966, p. 53-59. About the Nobel Prizes.

Folger, Anne and Gerald Gordon. 1962. Scientific accomplishment and social organization: a review of the literature. *American Behavioral Scientist,* **6**: 51-58.

Ford, B. J. 1968. Too many scientists? *New Scientist,* **40**: 257-259. Quite possibly, in England.

Freeman, C. 1967. Research comparisons. *Science,* **158**: 463-468.

Garvey, W. D. and B. C. Griffith. 1964. Scientific information exchange in psychology. *Science,* **146**: 1655-1659.

Garvey, W. D. and B. C. Griffith. 1967. Scientific communication as a social system. *Science,* **157**: 1011-1016.

Gibson, R. E. 1964. Our heritage from Galileo Galilei. *Science,* **145**: 1271-1276.

Glaser, B. G. 1964. Comparative failure in science. *Science,* **143**: 1012-1014.

Glass, B. 1965. The ethical basis of science. *Science,* **150**: 1254-1261.

Greenberg, Daniel S. 1965. The myth of the scientific elite. *Public Interest, No. 1:* Fall 1965, p. 51-62.

Gross, P. M. 1964. The fifth estate in the seventh decade (the status of science and scientists in the 1960's is reviewed.) *Science,* **143**: 13-20.

Gruenberger, F. J. 1964. A measure for crackpots. *Science,* **145**: 1413-1415.

Grünbaum, A. 1964. A bearing of philosophy on the history of science. *Science,* **143**: 1406-1412.

Halmos, P. R. 1968. Mathematics as a creative art. *American Scientist,* **56**: 375-389.

Hinshelwood, Cyril. 1967. Science and scientists. *Bulletin of the Atomic Scientists,* June 1967, p. 30-36.

Hoagland, H. 1964. Science and the new humanism. *Science,* **143**: 111-114.

Holton, G. 1960. Modern science and the intellectual tradition. *Science,* **131**: 1187-1193.

Hubbert, M. K. 1963. Are we retrogressing in science? *Science,* **139**: 884-890.

Jensen, Elwood V. 1969. The science of science. *Perspectives in Biology and Medicine,* **12**: 274-289.

Joravsky, D. 1962. The Lysenko affair. *Scientific American,* November 1962, p. 41-49.

Kantrowitz, A. 1967. Proposal for an institution for scientific judgement. *Science,* **156**: 763-767.

Kuhn, T. S. 1962. Historical structure of scientific discovery. *Science,* **136**: 760-764.

Lear, John. 1969. Will the science brain bank go conglomerate? *Saturday Review,* 5 July 1969, p. 37-44. About the National Academy of Science.

Lehman, Harvey C. 1960. The age decrement in outstanding scientific creativity. *American Psychologist,* **15**: 128-134.

Medawar, Peter. 1969. Science and literature. *Perspectives in Biology and Medicine,* **12**: 529-546.

Meltzer, Leo and James Salter. 1962. Organizational structure and the performance and job satisfaction of physiologists. Amer. Sociol. Review **27**: 351-362.

Merton, Robert K. 1963. Basic research and potentials of relevance. *The American Behavioral Scientist,* **6**: 86-90.

Merton, R. K. 1968. The Matthew Effect in science. The reward and communication systems of science are considered. *Science,* **159**: 56-63.

Merton, Robert K. 1969. Behavior patterns of scientists. *American Scientist,* **57**: 1-23.

Munster, J. H. and J. C. Smith. 1964. Savants, sandwiches, and space suits. *Science,* **145**: 1276-1281.

Munster, J. H. and J. C. Smith. 1964. The care and feeding of intellectual property. *Science,* **148**: 739-743.

Nash, Gerald D. 1963. The conflict between pure and applied science in nineteenth-century public policy: the California State Geological Survey, 1860-1874. *Isis,* **54**: 217-228.

Nichols, R. C. 1964. Career decisions of very able students. *Science,* **144**: 1315-1319.

Nussenzveig, H. M. 1969. Migration of scientists from Latin America. *Science,* **165**: 1328-1332.

Oppenheimer, R. 1963. Communication and comprehension of scientific knowledge. *Science,* **142**: 1143-1146.

Overhage, C.F.J. 1967. Science libraries: prospects and problems. *Science,* **155**: 802-806.

Pelz, D. C. 1967. Creative tensions in the research and development climate. *Science,* **157**: 160-165.

Pelz, Donald and Frank M. Andrews. 1962. Organizational atmosphere, motivation, and research contribution. *American Behavioral Scientist,* **6**: 43-47.

Penfield, W. 1963. Oriental renaissance in education and medicine. *Science,* **141**: 1153-1161.

Pierce, J. R. 1968. When is research the answer (knowledge can be power only when there are able people to use it.) *Science,* **159**: 1079-1080.

Platt, J. R. 1964. Strong inference. *Science,* **146**: 347-353.

Platt, John Rader. 1966. The step to man. *American Scientist,* **54**: 345-358. The operations of science. From a book of the same title.

Pollard, E. C. 1964. How to remain in a laboratory though head of a department. *Science,* **145**: 1018-1021.

Potts, A. M. 1965. Toward an esthetics of science. *Perspectives in Biology and Medicine,* **9**: 137-141.

Price, D. J. de Solla. 1964. Ethics of scientific publication. *Science,* **144**: 654-657.

Price, D. J. de Solla. 1965. Networks of scientific papers. *Science,* **149**: 510-515.

Price, D. J. de Solla. 1965. The science of science. *Bulletin of the Atomic Scientists,* October 1965, p. 2-8.

Price, W. J. and L. W. Bass. 1969. Scientific research and the innovative process. *Science,* **164**: 802-806.

Reagan, M. D. 1967. Basic and applied research: a meaningful distinction? *Science,* **155**: 1383-1386.

Reif, Fred and Anselm Strauss. 1965. The impact of rapid discovery upon the scientist's career. *Social Problems,* **12**: 297-311.

Ritterbush, Philip C. 1968. The biological muse. *Natural History,* October 1968, p. 26-31. Beauty in nature and beauty in art.

Roche, M. 1963. The humanities in the scientific curriculum. *Science,* **141**: 698-700.

Roe, A. 1961. The psychology of the scientist. *Science,* **134**: 456-459.

Roe, A. 1965. Changes in scientific activities with age. *Science,* **150**: 313-318.

Rossi, A. S. 1965. Women in science: why so few? *Science,* **148**: 1196-1202.

Russell, B. 1960. The social responsibilities of scientists. *Science,* **131**: 391-392.

Saltman, Paul. 1967. How it is — the science jungle. *Harper's,* February 1967, p. 102-104. A not too happy view of the state of the art.

Schilling, Warner R. 1962. Scientists, foreign policy, and politics. *American Political Science Review,* **56**: 287-300.

Seaborg, G. T. 1964. Science and the humanities. *Science,* **144**: 1199-1203.

Sherwin, C. W. and R. S. Isenson. 1967. Project Hindsight (a Defense Department study of the utility of research.) *Science,* **156**: 1571-1577.

Siever, Raymond. 1968. Science: Observational, experimental, historical. *American Scientist,* **56**: 70-71.

Simpson, G. G. 1963. Biology and the nature of science. *Science,* **139**: 81-88.

Snow, C. P. and others. 1961. The moral un-neutrality of science. *Science,* **133**: 255-262.

Sonneborn, T. M. 1968. H. J. Muller, crusader for human betterment. *Science,* **162**: 772-776.

Stark, Rodney. 1963. On the incompatibility of religion and science: a survey of American graduate students. *Journal for the Scientific Study of Religion,* **3**: 3-20.

Stegeman, Beatrice. 1969. Science as art. *Bulletin of the Atomic Scientists,* April 1969, p. 27-30.

Stern, C. 1965. Thoughts on research. *Science,* **148**: 772-773.

Stewart, W. H. 1966. The scientist in society. *Proceedings Third International Congress Human Genetics,* **3**: 5.

Storer, N. W. 1963. The coming changes in American science. *Science,* **142**: 464-467.

Szent-Gyorgyi, A. 1964. Teaching and the expanding knowledge. *Science,* **146**: 1278-1279.

Taylor, C. W. and R. L. Ellison. 1967. Biographical predictions of scientific performance. *Science,* **155**: 1075-1080.

Thomson, G. 1960. Two aspects of science. *Science,* **132**: 996-1000.

Townes, C. H. 1968. Quantum electronics and surprise in development of technology. *Science,* **159**: 699-702.

Weaver, W. 1964. Scientific explanation. *Science,* **143**: 1297-1300.

Weinberg, A. M. 1965. But is the teacher also a citizen? *Science,* **149**: 601-606.

Weinberg, Alvin M. 1970. In defense of science. *Science,* **167**: 141-145.

Weisskoff, Victor F. 1965. Why pure science? *Bulletin of the Atomic Scientists,* April 1965, p. 4-8.

West, Stewart. 1961. Class origin of scientists. *Sociometry,* **24**: 251-259.

White, Lynn. 1962. The act of invention: causes, context, continuities and consequences. *Technology and Culture,* **3**: 486-500.

Wilder, R. L. 1967. The role of intuition. *Science,* **156**: 605-610.

Wilson, Mitchell. 1969. How Nobel prizewinners get that way. *Atlantic,* December 1969, p. 69-74.

Wispé, L. G. 1963. Traits of eminent American psychologists. *Science,* **141**: 1256-1261.

Wolfgang, R. 1965. Pure research, cultism, and the undergraduate. *Science,* **150**: 1563-1565.

Zuckerman, H. 1967. The sociology of the Nobel Prize. *Scientific American,* November 1967, p. 25-33.

10. SCIENCE, TECHNOLOGY, AND SOCIETY

SCIENCE, TECHNOLOGY, AND SOCIETY/books

The references in this section concern the interrelations of science and technology on the one hand and of science and society on the other. Refer to the remarks at the beginning of Section 9. Sections 1 and 11 have related references and, should you wish even more, refer to Caldwell (1968) below.

Baier, K. and N. Rescher. Editors. 1969. *Values and the Future: The Impact of Technological Change on American Values* (Pittsburgh Values Project.) The Free Press. $14.95.

Barber, Bernard. 1952. *Science and the Social Order.* New York: Collier Books. $1.50. One of the first books on the sociology of science.

Barber, B. and W. Hirsch. Editors. 1962. *Sociology of Science.* Free Press. $9.50.

Barzun, Jacques. 1964. *Science: the Glorious Entertainment.* New York: Harper and Row. $6.95.

Berkner, Lloyd V. 1964. *The Scientific Age: The Impact of Science and Society.* New Haven: Yale University Press. $5.00.

Bernal, John D. 1954. *Science in History.* London: Watts.

Bernal, John D. 1967. *Social Function of Science.* Cambridge: Mass. Inst. Tech. Press. $3.95.

Black, C. E. 1966. *The Dynamics of Modernization.* New York: Harper & Row. $1.60.

Boulding, K. E. 1964. *The Meaning of the 20th Century.* New York. Harper Colophon Books. $1.45. Some problems of entering a technological world.

Brierley, J. K. 1967. *Biology and the Social Crisis. A Social Biology for Everyman.* London: Heinemann.

Brooks, D. B. and J. V. Krutilla. 1969. *Peaceful Use of Nuclear Explosives: Some Economic Aspects.* Baltimore: Johns Hopkins Press. $1.50.

Burke, John G. Editor. 1966. *The New Technology and Human Values.* Belmont, California: Wadsworth Publications. $4.95.

Burke, John G. 1969. *Technology and Values.* In "Great ideas of today 1969", Encyclopedia Britannica, Inc.

Burnham, Jack. 1968. *Beyond Modern Sculpture: The Effects of Science and Technology on the Sculpture of this Century.* New York: Braziller. $15.00.

Bush, Vannevar. 1945. *Science, the Endless Frontier.* Washington: U.S. Government Printing Office.

Caldwell, Lynton K. Editor. 1968. *Science, Technology, and Public Policy: A Selected and Annotated Bibliography.* Two volumes. Bloomington: Indiana University.

Cleaveland, Frederick N. 1959. *Science and State Government: A Study of the Scientific Activities of State Government Agencies in Six States.* Chapel Hill: Univ. of North Carolina Press. $4.50.

Crowther, J. G. 1967. *The Social Relations of Science.* London: Cresset Press. $8.95.

Crowther, J. G. 1967. *Science in Modern Society.* London: Cresset Press. $8.00.

Daedalus. The Winter 1958 issue is devoted to "Science and the Modern World View."

Daedalus. The Spring 1962 issue is devoted to "Science and Technology in Contemporary Society."

Daedalus. The Winter 1965 issue is devoted to "Science and Culture". (See also Gerald Holton 1965).

Derry, T. K. and Trevor I. Williams. 1961. *A Short History of Technology from the Earliest Times to A.D. 1900.* New York: Oxford University Press. In 782 pages. $8.50.

Dickson, James F. and J.H.U. Brown. Editors. *Future Goals of Engineering in Biology and Medicine.* New York: Academic Press. $16.00. Proceedings of an international conference.

Dupré, J. Stefan and Sanford A. Lakoff. 1962. *Science and the Nation: Policy and Politics.* Englewood Cliffs, N.J.: Prentice-Hall.

Dupree, A. Hunter. 1957. *Science in the Federal Government.* New York: Harper Torchbooks. $7.50.

Ellul, Jacques. 1964. *The Technological Society.* New York: Random House. $2.45.

Fehl, Noah Edward. 1965. *Science and Culture.* Hong Kong: Chung Chi Publications. $8.75.

Ferkiss, Victor C. 1969. *Technological man: The Myth and the Reality.* New York: George Braziller. $7.95.

Forbes, R. J. 1968. *The Conquest of Nature: Technology and Its Consequences.* New York: Praeger. $1.25.

Forbes, R. J. and E. J. Dijksterhuis. 1963. *A History of Science and Technology.* 2 volumes. Baltimore: Penguin Books. $1.25 per volume.

Fromm, Erich. 1969. *The Revolution of Hope: Towards a Humanized Technology.* New York: Harper and Row. $5.95.

Galbraith, John Kenneth. 1967. *The New Industrial State.* New York: Signet Books. $1.25.

Gerstl, J. E. and S. P. Hutton. 1966. *Engineers: The Anatomy of a Profession.* New York: Tavistock Publications. $7.75.

Gilpin, Robert and Christopher Wright. Editors. 1964. *Scientists and National Policy Making.* New York: Columbia University Press. $9.00.

Glass, B. 1959. *Science and Liberal Education.* Louisiana State University Press. $3.00.

Greenberg, Daniel S. 1967. *The Politics of Pure Science.* New York: New American Library. See Review by Weinberg in *Minerva,* 7: 52-63 (1968-9). $7.95.

Haskins, Caryl. 1964. *The Scientific Revolution and World Politics.* New York: Harper and Row.

Hill, A. V. 1960. *The Ethical Dilemma of Science.* New York: Oxord University Press. $7.50.

Holton, Gerald. Editor. 1958. *Science and the Modern Mind.* Boston: Beacon Press. $3.95.

Holton, G. Editor. 1965. *Science and Culture.* Boston: Houghton Mifflin. $6.00.

Juenger, Fredrick George. 1949. *The Failure of Technology: Perfection Without Purpose.* Hinsdale, Illinois: Henry Regnery Co.

Kaplan, Norman. Editor. 1965. *Science and Society.* Chicago: Rand McNally. $10.00.

Kidd, Charles V. 1959. *American Universities and Federal Research.* Cambridge: Harvard Univ. Press. $6.00.

Kornhauser, William. 1962. *Scientists in Industry: Conflict and Accommodation.* Berkeley: University of California Press. $6.00.

Kranzberg, Melvin and Carroll W. Pursell, Jr. Editors. 1967. *Technology in Western Civilization.* Volume I. *The Emergence of Modern Industrial Technology: Earliest Times to 1900.* Volume II. *Technology in the Twentieth Century.* New York: Oxford University Press. $8.50 ea.

Levy, Lillian. 1965. *Space: Its Impact on Man and Society.* New York: W. W. Norton.

McCaney, James L. 1960. *Science and Public Administration.* University, Alabama: Univ. of Alabama Press.

Marine, G. 1969. *America the Raped: The Engineering Mentality and the Devastation of a Continent.* New York: Simon & Schuster. $5.95.

Marsak, Leonard M. 1964. *The Rise of Science in Relation to Society.* New York: Macmillan. $1.95.

Massachusetts Institute of Technology. 1961. *Science and Public Policy.* Cambridge, Mass: Mass. Inst. of Technology. A collection of articles.

Massachusetts Institute of Technology. 1968. *Science and Public Policy.* Prepared by the Department of Political Science.

National Academy of Sciences. 1969. *The Impact of Science and Technology on Regional Economic Development.* $3.95.

National Academy of Sciences. 1965. *Basic Research and National Goals.* Washington: U.S. Government Printing Office.

National Academy of Sciences. Committee on Science and Astronautics. 1967. *Applied Science and Technological Progress.* Washington: U.S. Government Printing Office. $1.50.

National Academy of Sciences. 1969. Committee on Science and Astronautics. *Technology: Processes of Assessment and Choice.* Washington: U.S. Government Printing Office. $.75. A penetrating attempt to assay the advantages and disadvantages of technology.

National Commission on Technology, Automation, and Economic Progress. 1966. *Technology and the American Economy.* Plus an appendix of 6 volumes. Washington: U.S. Government Printing Office. Report $.75. Appendix $1.00 – $2.50 per volume.

Nelson, W. R. Editor. 1968. *The Politics of Science: Readings in Science, Technology, and Government.* New York: Oxford University Press. $3.95.

Orlans, Harold. Editor. 1968. *Science Policy and the University.* Washington: The Brookings Institution. $2.95. And the relation of both to the federal government. Papers from a seminar.

Penick, J. L. and others. Editors. 1965. *The Politics of American Science: 1939 to the Present.* Chicago: Rand McNally.

Piccard, Paul J. Editor. 1969. *Science and Policy Issues.* Lecturer in government and science. Itasca, Illinois: F. E. Peacock. By eight lecturers.

Piel, Gerald. 1961. *Science in the Cause of Man.* New York: Knopf.

Polanyi, Michael. 1964. *Science, Faith and Society.* Chicago: Univ. of Chicago Press. $1.50.

Price, D. K. 1962. *Government and Science: Their Dynamic Relation in American Democracy.* New York. Oxford University Press. $5.95.

Reagan, Michael D. 1969. *Science and the Federal Patron.* New York: Oxford University Press. $7.50.

Roszak, Theodore. 1969. *The Making of a Counter Culture.* Garden City, New York: Doubleday Anchor.

Scientific American. The entire September 1963 issue is devoted to "Technology."

Seitz, Frederick. 1966. *Science, Government, and the Universities.* Seattle: University of Washington Press. $3.95.

Seligman, Ben B. 1968. *Economics of Dissent.* Chicago: Quadrangle Books. $10.00. Man, technology, government, business, and labor as observed by an economist.

Silvert, Kalman H. Editor. 1969. *The Social Reality of Scientific Myth: Science and Social Change.* New York: American Universities Field Staff.

Singer, Charles et al. Editors. 1954-1958. *A History of Technology.*
Volume I. *From Early Times to the Fall of Ancient Empires.*
Volume II. *The Mediterranean Civilizations and the Middle Ages.*
Volume III. *From the Renaissance to the Industrial Revolution.*
Volume IV. *The Industrial Revolution.*
Volume V. *The Late Nineteenth Century.* c. 1850 to c. 1900.
Oxford: at the Clarendon Press. $30.25 ea.

Skinner, B. F. 1948. *Walden Two.* New York: Macmillan. $6.95.

Snow, C. P. 1962. *Science and Government.* New York. Mentor Book. $.60.

Snow, C. P. 1963. *The Two Cultures; and a Second Look.* New York: Mentor Book. $.75. Not only about how difficult it is for scientist and non-scientist to communicate but how this lack of ability to communicate makes the resolution of man's problems all the more difficult.

Stevenson, Adlai E. and others. 1965. *Science and Society: a Symposium.* Rochester: Xerox Corporation.

Tassel, D. D. von and M. G. Hall. 1966. *Science and Society in the United States.* Homewood, Illinois. The Dorsey Press. Part of a series in American History.

U. S. Department of Agriculture. 1968. *Yearbook 1968. Science for Better Living.* Washington: U.S. Government Printing Office.

U. S. House of Representatives. Committee on Science and Astronautics. 1966. *Government, Science, and Public Policy.* Washington: U.S. Government Printing Office. $.40.

U. S. House of Representatives. 1968. Proceedings before the Subcommittee on Science, Research, and Development of the Committee on Science and Astronautics. *Technology Assessment Seminar.* Washington: U.S. Government Printing Office.

U. S. President's Advisory Committee on Labor-Management Policy. 1965. *Seminars on Private Adjustments to Automation and Technological Change.* Washington: U.S. Government Printing Office.

Van Melsen, Andrew G. 1961. *Science and Technology.* Pittsburgh: Duquesne Univ. Press. $6.20.

Warner, Aaron W. and others. Editors. 1965. *The Impact of Science and Technology.* New York: Columbia University Press. $7.50.

Warner, Aaron W. et al. 1969. *The Environment of Change.* New York: Columbia University Press. $7.50. Papers from a symposium on science, technology, and society.

Wiesner, Jerome B. 1965. *Where Science and Politics Meet.* New York: McGraw-Hill. $6.95. A collection of essays by one who should know.

Wilkinson, John. Editor. 1967. *Technology and Human Values.* Santa Barbara, California. Center for the Study of Democratic Institutions.

Ziman, John. 1968. *Public Knowledge: The Social Dimension of Science.* New York: Cambridge University Press. $1.95.

SCIENCE, TECHNOLOGY, AND SOCIETY/articles

Anderson, C. P. 1964. Scientific advice for Congress. *Science,* **144**: 29-32.

Argyris, Chris. 1968. On the effectiveness of research and development organizations. *American Scientist,* **56**: 344-355.

Astin, A. W. 1963. Undergraduate institutions and the production of scientists. *Science,* **141**: 334-338.

Baker, William O. 1967. Engineering and science: A sum and not a difference. *American Scientist,* **55**: 80-87.

Basalla, George. 1969. Organizing science — the debate continues. *New Scientist,* 10 April 1969, p. 76-77. For teaching and research.

Bates, Frederich L. 1969. The impact of automation on society. *Bulletin of the Atomic Scientists,* June 1969, p. 4-6.

Beals, Ralph. 1967. Cross-cultural research and government policy. *Bulletin of the Atomic Scientists,* October 1967, p. 18-24.

Bell, Daniel. 1965. The bogey of automation. *New York Review of Books,* **5**, No. 2, p. 23-25.

Benn, A. W. 1968. Politics in a technological age. *New Scientist,* **38**: 506-507; 572-573.

Benn, A. W. 1969. Maintaining human supremacy. *New Scientist,* **43**: 274-276. Over the computers and their keepers.

Bhabha, H. J. 1969. Science and problems of development. *Science,* **151**: 541-548.

Blackett, P.M.S. 1967. The ever widening gap. *Science,* **155**: 959-964.

Bovet, Daniel, B. A. Houssay, and C. Heymans. 1965. Role of the scientist in modern society — a symposium. *Perspectives in Biology and Medicine,* **8**: 533-558.

Bresler, J. B. 1968. Teaching effectiveness and government awards. *Science,* **160**: 164-167.

Briggs, A. 1963. Technology and economic development. *Scientific American,* September 1963, p. 52-61.

Brode, W. R. 1960. Development of a science policy. *Science,* **131**: 9-15.

Brode, W. R. 1964. Approaching ceilings in the supply of scientific manpower. *Science,* **143**: 313-324.

Brooks, H. 1967. Applied science and technological progress. *Science,* **156**: 1706-1712.

Brooks, H. 1968. Physics and the polity (are physics and society on divergent courses?) *Science,* **160**: 396-400.

Bulletin of the Atomic Scientists. 1969. The entire September 1969 issue is devoted to an assessment of landing men on the moon, not only the science involved but also the politics and technological impact.

Bundy, Mc G. 1963. The scientist and national policy. *Science,* **139**: 805-809.

Buzzati-Traverso, A. A. 1965. Scientific research: the case for international support. *Science,* **148**: 1440-1444.

Carey, W. D. 1967. Roles of the Bureau of the Budget. *Science,* **156**: 206-8, 213.

Carroll, J. D. 1967. The process values of university research. *Science,* **158**: 1019-1024.

Carson, Gerald. 1968. Bugs and beasts before the law. *Natural History,* April 1968, p. 6-19. The animal's day in court.

Chapman, Richard L. 1969. Congress and science policy. *Bulletin of the Atomic Scientists,* March 1969, p. 4-7.

Chedd, Graham. 1968. The ethics of biology. *New Scientist,* **40**: 10-11.

Cohn, V. 1965. Are we really telling the people about science. *Science,* **148**: 750-753.

Commoner, Barry. 1964. The responsibility of science to man. *Perspectives in Biology and Medicine,* **8**: 85-92.

Conant, James B. 1967. Scientific principles and moral conduct. *American Scientist,* **55**: 311-328.

Conferences on science and world affairs. 1961. *Science,* **134**: 984-991.

Cooper, J. D. 1965. Onward the management of science. *Science,* **148**: 1433-1439.

Cranberg, Lawrence. 1968. Law-scientific and juridical. *American Scientist,* **56**: 244-253.

Daddario, E. Q. 1966. A revised charter for the Science Foundation. *Science,* **152**: 42-45.

Daddario, E. Q. 1968. Academic science and the Federal Government. *Science,* **162**: 1249-1251.

Daniels, G. H. 1967. The Pure-Science ideal and democratic culture. *Science,* **156**: 1699-1705.

Dart, F. E. and P. L. Pradhan. 1967. Cross-cultural teaching of science. *Science,* **155**: 649-656.

Davies, Duncan and others. 1968. Education for a restless society: technology and liberty. *New Scientist,* **39**: 594-595, 663-664; **40**: 31-33, 88-90.

Davis, R. W. and R. Amann. 1969. Science policy in the U.S.S.R. *Scientific American,* June 1969, p. 19-29.

De Witt, N. 1961. Reorganization of science and research in the U.S.S.R. *Science,* **133**: 1981-1991.

Dobzhansky, Theodosius. 1968. On genetics, sociology, and politics. *Perspectives in Biology and Medicine,* **11**: 544-554.

Dubos, René. 1961. Scientist and public. *Science,* **133**: 1207-1211.

Dubos, René. 1968. The human environment in technological societies. *Rockefeller University Review,* July-August 1968. p. 2-11.

DuBridge, L. A. 1967. University basic research. *Science,* **157**: 648-650.

DuBridge, L. A. 1969. Science serves society. *Science,* **164**: 1137-1140.

DuBridge, L. A. and N. Kaplan. 1960. Research overhead. *Science,* **132**: 1746-1749.

Dupree, A. H. 1961. Public education for science and technology. *Science,* **134**: 716-718.

Ekman, P. 1963. Divergent reactions to the threat of war. *Science,* **139**: 88-94.

Engstrom, Elmer W. 1967. Science, technology, and statesmanship. *American Scientist,* **55**: 72-79.

Eren, Nuri. 1969. Supply, demand, and the brain drain. *Saturday Review,* 2 August 1969, p. 10-12, 32-33.

Etzioni, A. 1968. How may Congress learn? *Science,* **159**: 170-171. About Science.

Etzioni, A. 1969. Agency for technological development for domestic programs. *Science,* **164**: 43-50.

Evans, William M. 1962. Role strain and the norm of reciprocity in research organizations. *American Journal of Sociology,* **68**: 346-354.

Eysenck, Hans. 1969. The technology of consent. *New Scientist,* **42**: 688-690. Will social psychology mold our future?

Ferry, Wilbur H. 1968. Must we rewrite the constitution to control technology? *Saturday Review,* 2 March 1968, p. 50-54.

Ferry, W. H. 1968. The technolphiliacs. *Center Magazine,* July 1968, p. 45-49.

Finniston, H. M. 1968. A house for scientists? *New Scientist,* **38**: 682-685. To influence public policy, in England.

Fleming, Donald F. 1965. The big money and high politics of science. *Atlantic,* August 1965. p. 41-45.

Florey, Lord. 1965. Role of the scientist in modern society: the first three hundred years. *Perspectives in Biology and Medicine,* **8**: 279-288.

Ford, B. J. 1968. Telling the people. *New Scientist,* **37**: 89-90. About science and technology.

Fores, Michael. 1969. All one culture — or three? *New Scientist,* **42**: 637-638. C. P. Snow's Two Cultures after 10 Years.

Fry, T. C. 1964. Mathematicians in industry. *Science,* **143**: 934-938.

Gardner, J. W. 1966. The government, the universities, and biomedical research. *Science,* **153**: 1601-1603.

Gardner, John W. 1968. Toward a humane technology. *Science and Technology,* January 1968, p. 56-60.

Gideonse, H. D. 1968. Research, development, and the improvement of education. *Science,* **162**: 541-545.

Gillispie, Charles C. 1968. Remarks on social selection as a factor in the progressivism of science. *American Scientist,* **56**: 439-450. Science as related to politics and social progress.

Glass, B. 1960. The academic scientist. *Science,* **132**: 598-603.

Glass, B. 1966. The Japanese Science Education Center. *Science,* **154**: 221-228.

Goodenough, W. H. 1964. Arms control and behavioral science. *Science,* **144**: 821-824.

Goodman, Paul. 1969. Can technology be humane? *New York Review of Books,* 20 November 1969, p. 27-34.

Gould, Donald. 1968. Canada's attempt to harness science. *New Scientist,* **40**: 180-184.

Greenfield, M. 1963. Science goes to Washington. *Science,* **142**: 361-367.

Gross, P. M. 1963. R & D, and the relations of science and government. *Science,* **142**: 645-650.

Grubel, H. G. 1966. The brain drain: a U.S. dilemma. *Science,* **154**: 1420-1424.

Gwynne, Peter. 1968. U. S. science on the defensive. *New Scientist,* **39**: 11-12. As the funds dry up.

Hamilton, David. 1968. Predicting technology's future. *New Scientist,* **39**: 67-69.

Handler, P. 1967. Academic science and the Federal Government. *Science,* **157**: 1140-1146.

Handler, P. 1967. Federal science policy. *Science,* **155**: 1063-1066.

Handler, Philip. 1969. Science, scientists, and society. *Report of the Twelfth Annual Meeting of the National Research Council,* p. 7-25. Washington: National Academy of Sciences.

Hoelscher, H. E. 1969. Technology and social change. *Science,* **166**: 68-72.

Hohennemser, Kurt H. 1966. The supersonic transport. *Scientist and Citizen,* April 1966, p. 1-10.

Holden, P. J. 1969. Innovation and the establishment. *New Scientist,* **43**: 375-377. The problems of trying to do something in Britain.

Hornig, D. F. 1965. Universities and Federal science policies. *Science,* **150**: 847-851.

Hornig, D. F. 1968. Federal research laboratories. *Science,* **160**: 627-628.

Hornig, D. F. 1969. United States science policy: its health and future direction. *Science,* **163**: 523-528.

Johnson, D. L. and A. L. Kobler. 1962. The man-computer relationship. *Science,* **138**: 873-879.

Johnson, W. H. 1968. Education for management and technology in the 1970's. *Science,* **160**: 620-627.

Jordan, L. F. 1967. Coordinated planning for science in Communist Europe. *Science,* **155**: 796-802.

Kaplan, N. 1960. Research overhead and the universities. *Science,* **132**: 400-404.

Kidd, C. V. 1965. Research on research in Venezuela. *Science,* **149**: 727-729.

King, Cecil. 1968. Involving scientists in society. *New Scientist,* **37**: 594-595.

Kirk, P. L. 1963. Criminalistics. *Science,* **140**: 367-370.

Kistiakowsky, G. B. 1960. Science and foreign affairs. *Science,* **131**: 1019-1024.

Kistiakowsky, G. B. 1966. Allocating support for basic research — and the importance of practical application. *Bulletin of the Atomic Scientists,* February 1966, p. 12-18.

Koprowski, H. 1965. A new science city in Siberia. *Science,* **149**: 947-949.

Kranzberg, M. 1962. The newest history: science and technology. *Science,* **136**: 463-468.

Kranzberg, Melvin. 1967. The unity of science-technology. *American Scientist,* **55**: 48-66.

Kranzberg, Melvin. 1968. The disunity of science-technology. *American Scientist,* **56**: 21-34. Which way is it, Melvin?

Ladd, E. C. 1969. Professors and political petitions. *Science,* **163**: 1425-1430.

Lafore, L. 1964. One campus, two cultures. *Science,* **145**: 790-795.

Lear, John. 1968. Public policy and the study of man. *Saturday Review,* 7 September 1968, p. 59-62.

Lepawsky, A. 1965. Academic freedom and political liberty. *Science,* **150**: 1559-1563.

Lindvall, Frederick C. 1968. Science and the social imperatives. *American Scientist,* **56**: 303-311.

London, I. D. 1962. De-Stalinization in Soviet physiology. *Science,* **138**: 16-17.

Long, F. A. 1969. Support of scientific research and education in our universities. *Science,* **163**: 1037-1040.

Lopes, J. L. 1966. Science for development — a view from Latin America. *Bulletin of the Atomic Scientists.* September 1966, p. 7-11.

Low, Ian. 1968. The facts of technological life. *New Scientist,* **38**: 295. Too much, too wrong.

Lynn, Richard. 1969. Genetic implications of the brain drain. *New Scientist,* **41**: 622-625. Go west, bright genes, go west.

McDermott, John. 1969. Technology: the opiate of the intellectuals. *New York Review,* 31 July 1969, p. 25-35. A widely-discussed article.

MacLeish, Archibald. 1968. The great American frustration. *Saturday Review,* 13 July 1968, p. 13-16. Some adverse effects of science and technology on our lives.

Macy, Jr., J. W. 1965. The scientist in the Federal service. *Science,* **148**: 51-54.

Maddox, J. 1964. Science policy shapes up as issue in coming British election. *Science,* **143**: 1146-1148.

Marshak, R. E. 1966. Basic research in the university and industrial laboratory. *Science,* **154**: 1521-1524.

Marshall, Nelson. 1968. Ecology: the social science and resource use. *Bioscience,* **18**: 765-766.

Martino, J. P. 1969. Science and society in equilibrium. *Science,* **165**: 769-772.

Mathewson, J. H. 1962. Science for the citizen: an educational problem. *Science,* **138**: 1375-1379.

Mead, Margaret. 1969. Public policy and behavioral science. *Bulletin of the Atomic Scientists,* December 1969, p. 8-10.

Mesthene, E. G. 1964. Can only scientists make government science policy? *Science,* **145**: 237-240.

Mesthene, Emmanuel G. 1965. On understanding change: the Harvard University Program on Technology and Society. *Technology and Culture,* **6**: 222-235.

Mesthene, E. G. 1968. How technology will shape the future. *Science,* **161**: 135-143.

Miller, Arthur S. et al. 1968. Science, technology, and the law. *Saturday Review,* 3 August 1968, p. 39-52. A series of articles.

National Academy Public Policy Committee. 1964. Federal support of science: a formula for cooperation. *Science,* **143**: 1300-1303.

Newell, H. E. and L. Jaffe. 1967. Impact of space research on science and technology. *Science,* **157**: 29-39.

Odhiambo, T. R. 1967. East Africa: science for development. *Science,* **158**: 876-881.

Oldham, C.H.G. 1965. Science in mainland China: a tourist's impression. *Science,* **147**: 706-714.

Orlans, H. 1963. Federal expenditures and the quality of education. *Science,* **142**: 1625-1629.

Orlans, H. 1965. Some current problems of government science policy. *Science,* **149**: 37-40.

Orlans, H. 1967. Developments in Federal policy toward university research. *Science,* **155**: 665-668.

Orleans, L. A. 1967. Research and development in Communist China. *Science,* **157**: 392-400.

Osman, Tory. 1968. Better value from science. *New Scientist,* **38**: 165. Supporting science in Canada.

Pake, G. 1967. Basic research and financial crisis in the universities. *Science,* **157**: 517-520.

Panel on Basic Research (PSAC). 1960. Scientific progress and the Federal Government. *Science,* **132**: 1802-1815.

Panel on Privacy and Behavioral Research. 1967. Privacy and behavioral research. *Science,* **155**: 535-538.

Parsons, Talcott. Editor. 1968. Knowledge and society: American sociology. *Voice of America Forum Lectures.*

Pettit, L. K. 1969. Congress, confusion, and indirect costs. *Science,* **163**: 1301-1305.

Pilpel, Harriet F. 1965. Sex vs. the law. *Harper's,* January 1965, p. 35-40.

Pitzer, K. S. 1967. How much research? *Science,* **157**: 779-781.

Platt, J. R. 1962. National laboratories for biology. *Science,* **136**: 859-861.

Potter, V. R. 1964. Science and society. *Science,* **146**: 1018-1022.

Price, Derek J. De Solla. 1965. Is technology historically independent of science? A study in statistical historiography. *Technology and Culture,* **6**: 553-568.

Price, D. K. 1962. The scientific establishment. *Science,* **136**: 1099-1106.

Price, D. K. 1966. Federal money and university research. *Science,* **151**: 285-290.

Price, D. K. 1969. Purists and politicians. *Science,* **163**: 25-31.

Quinn, J. B. 1965. National planning of science and technology in France. *Science,* **150**: 993-1003.

Reagan, M. D. 1969. Congress meets science: the appropriations process. *Science,* **164**: 926-931.

Reif, F. 1961. The competitive world of the pure scientist. *Science,* **134**: 1957-1962.

Roback, H. 1968. Congress and the science budget. *Science,* **160**: 964-971.

Roback, H. 1969. Do we need a Department of Science and Technology? *Science,* **165**: 36-43.

Roberts, Walter Orr. 1967. Science, a wellspring of our discontent. *American Scientist,* **55**: 3-14. Nevertheless, we must learn to live with it.

Rose, Hilary and Steven Rose. 1969. Knowledge and power. *New Scientist,* **42**: 108-109. Plans for the recently formed British Society for Social Responsibility in Science.

Rose, Steven and Hilary Rose. 1969. Democracy and science. *New Scientist.* 20 November 1969. p. 397-402.

Sapolsky, H. M. 1968. Science advice for state and local government. *Science,* **160**: 280-284.

Sayre, W. S. 1961. Science and American science policy. *Science,* **133**: 859-864.

Science in the American context. 1965. A group of papers in *Journal of World History,* **8**: No. 4.

Seaborg, G. T. 1962. A scientific society — the beginnings. *Science,* **135**: 505-509.

Schiller, Herbert I. 1968. Social control and individual freedom. *Bulletin of the Atomic Scientists,* May 1968, p. 16-21.

Schwartz, Charles and others. 1969. Science and social controls. *Bulletin of the Atomic Scientists,* May 1969, p. 21-36. Five scientists give their views on the use and abuse of science by society.

Seitz, F. 1963. Space science and the universities. *Science,* **141**: 614-618.

Seitz, Frederick. 1966. Science and modern man. *American Scientist,* **54**: 227-243.

Shankleman, Eric. 1968. The Wampanoag effect. *New Scientist,* **37**: 424-428. Resistance to technical innovation.

Shannon, J. A. 1964. Science and federal programs. *Science,* **144**: 976-978.

Shannon, J. A. and C. V. Kidd. 1961. Federal support of research careers. *Science,* **134**: 1399-1402.

Simpson, George Gaylord. 1966. Naturalistic ethics and the social sciences. *American Psychologist,* **21**: 27-36.

Simpson, George Gaylord. 1967. Biology and the public good. *American Scientist,* **55**: 161-175.

Sinclair, Craig. 1969. Costing the hazard of technology. *New Scientist,* **44**: 120-122.

Singer, A. E. 1966. Science broadcasting in Britain. *Science,* **154**: 743-745.

Skolnikoff, E. B. 1966. Scientific advice in the State Department. *Science,* **154**: 980-985.

Snow, C. P. 1966. Government, science, and public policy. *Science,* **151**: 650-653.

Spiers, Maurice. 1968. Whitehall types: old and new. *New Scientist,* **40**: 198-199. Trying to inject scientists into the Civil Service in England.

Starr, C. 1969. Social benefits versus technological risk. *Science,* **165**: 1232-1238.

Stein, B. R. 1969. Academic research in Germany: a new support program. *Science,* **165**: 1096-1100.

Stone, M. G. and M. Warner. 1969. Planning and privacy: the computer threat. *New Scientist,* **42**: 238-239.

Storer, Norman W. 1962. Some sociological aspects of Federal science policy. *American Behavioral Scientist,* **7**: 27-30.

Sutherland, Gordon. 1967. Some aspects of the U.S.A. today: science. *American Scientist,* **55**: 296-310. As seen through British eyes.

Swain, D. C. 1962. The rise of a research empire: NIH, 1930-1950. *Science,* **138**: 1233-1237.

Szent-Gyorgyi, Albert. 1969. The dual world of man: reflections on science and government. *Bulletin of the Atomic Scientists,* October 1969, p. 33-34, 37.

Tannenbaum, P. H. 1963. Communication of science information. *Science,* **140**: 579-583.

Teller, Edward. 1966. The role of applied science. *Bulletin of the Atomic Scientists,* March 1966, p. 15-19.

Thring, Meredith and others. 1968. White-hot revolution. *New Scientist,* **39**: 644-653. Politics and science.

Todd, A. R. 1965. Scientific policy in Britain. *Science,* **149**: 156-162.

Truman, D. B. 1968. The social sciences and public policy. *Science,* **160**: 508-512.

Uyeki, E. S. and F. B. Cliffe, Jr. 1963. The Federal Scientist-Administrator. *Science,* **139**: 1267-1270.

Vucinick, A. 1968. Science and morality. *Science,* **159**: 1208-1212.

Waddington, C. H. 1968. A British perspective on American science policy. *Science,* **160**: 46-48.

Walker, E. A. 1967. National Science Board: its place in national policy. *Science,* **156**: 474-477.

Warner, J. C. 1963. National goals and the university. *Science,* **142**: 462-464.

Waterman, A. T. 1960. National Science Foundation: a ten year resume. *Science,* **131**: 1341-54.

Waterman, A. T. 1965. The changing environment of science. *Science,* **147**: 13-18.

Waterman, A. T. 1966. Federal support of science. *Science,* **153**: 1359-1361.

Weaver, Warren. 1969. Basic research and the common good. *Saturday Review,* 9 August 1969, p. 17-18, 54.

Weinberg, A. M. 1961. Impact of large-scale science on the United States. *Science,* **134**: 161-164.

Weinberg, A. M. 1962. The Federal laboratories and science education. *Science,* **136**: 27-30.

Weinberg, Alvin M. 1963-4. Criteria for scientific choice. *Minerva,* **1**: 159-171; **3**: 3-14.

Weinberg, Alvin M. 1966. Can technology replace social engineering? *Bulletin of the Atomic Scientists,* December 1966, p. 4-8.

Wheeler, Harvey. 1969. Bringing science under law. *Center Magazine,* March 1969, p. 59-67. See also: May 1969, p. 79-85.

White, Sarah. 1968. Educating scientists in the U.S.S.R. *New Scientist,* **40**: 33-34.

Wiener, N. 1960. Some moral and technical consequences of automation. *Science,* **131**: 1355-1358.

Wolfle, D. 1960. Government organization of science. *Science,* **131**: 1407-1417.

Wolfle, D. 1965. The support of science in the U.S. *Scientific American,* July 1965, p. 19-25.

Workman, E. J. 1962. The problem of weather modification. *Science,* **138**: 407-412.

11. WAR AND PEACE

WAR AND PEACE/books

Modern war depends so much on science and technology that it seems necessary to include it in this bibliography. But there are also references to arms control and other attempts to achieve peace. Unfortunately moral opposition to war has never proved very effective, and one of the main arguments currently advanced against war is that it costs too much. It would be an ironic resolution to one of man's oldest problems if he finally decided to live in peace with his neighbor, not because it is wrong to kill him, but because it is too expensive to try. See also the references in Sections 2A and 10.

Barnet, Richard J. 1970. *The Economy of Death.* New York: Atheneum. $2.95. The politics of financial support for the military-industrial complex.

Brennan, Donald G. Editor. 1961. *Arms Control, Disarmament, and National Security.* New York: George Braziller. $6.00.

Brown, Neville. 1965. *Nuclear War: The Impending Strategic Deadlock.* New York: Praeger. $6.50.

Calder, Nigel. 1968. *Unless Peace Comes.* New York. Viking Press. Paperback. $5.75.

Chayes, Abraham and Jerome B. Wiesner. 1969. *ABM: An Evaluation of the Decision to Deploy an Antiballistic Missile System.* New York: Signet Books.

Clarke, Robin. 1968. *The Silent Weapons.* New York: David McKay. $4.95. Chemical and biological warfare.

Daedalus. The fall 1960 issue is devoted to "Arms Control". (See also D. G. Brennan 1961.)

Daedalus. The spring 1966 issue is devoted to "Conditions of World Order."

Hersh, Seymour M. 1968. *Chemical and Biological Warfare; American Hidden Arsenal.* Indianapolis: Bobbs – Merrill. $7.50.

Humphrey, H. H. and others. 1969. *Antiballistic Missile: Yes or No?* A Special Report from the Center for the Study of Democratic Institutions. New York. Hill and Wang.

Huntington, Samuel P. Editor. 1962. *Changing Patterns of Military Politics.* New York: Free Press of Glencoe.

Janowitz, Morris. 1964. *The Military in the Political Development of New Nations: An Essay in Comparative Analysis.* Chicago: Univ. of Chicago Press. $4.50.

Kaysen, Carl. 1968. *Military Strategy, Military Forces, and Arms Control.* In "Agenda for the nation". Edited by Kermit Gordon. Washington: The Brookings Institute.

Lapp, Ralph E. 1967. *The Weapons Culture.* New York: Norton. $4.95.

Lilienthal, D. E. 1963. *Change, Hope, and the Bomb.* Princeton: Princeton University Press. $1.95.

McCarthy, Richard D. 1969. *The Ultimate Folly: War by Pestilence, Asphyxiation and Defoliation.* New York: Knopf. $5.95. Chemical and biological warfare, described by a Congressman.

McNamara, Robert S. 1968. *The Essence of Security: Reflections in Office.* New York: Harper and Row. $4.95.

Manchester, William. 1968. *The Arms of Krupp, 1587-1968.* Boston: Little, Brown. $12.50.

Melman, Seymour. Editor. 1962. *Disarmament: Its Politics and Economics.* Boston: American Academy of Arts and Sciences.

National Academy of Sciences. 1968. *Proceedings of the Symposium on Postattack Recovery from Nuclear War,* November 6-9, 1967. Washington: National Academy of Sciences.

Rathjens, George W. 1969. *The Future of the Strategic Arms Race: Options for the 1970's.* Carnegie Endowment for International Peace.

Swomley, Jr., John M. 1964. *The Military Establishment.* Boston: Beacon Press. $6.00.

Wright, Quincy. 1965. *A Study of War.* Chicago: University of Chicago Press. $20.00. (An abridged edition published 1964.)

WAR AND PEACE/articles

Alexander, Archibald S. 1969. The cost of world armaments. *Scientific American,* October 1969, p. 21-27.

American Anthropological Association. 1967. War: The anthropology of armed conflict and aggression. *Natural History,* December 1967, p. 39-70. A symposium. Valuable bibliography.

Aron, Raymond. 1965. The spread of nuclear weapons. *Atlantic,* January 1965, p. 44-50.

Atlantic. 1968. No more Vietnams? The future of American foreign policy. *Atlantic,* November 1968, p. 99-116 and December 1968, p. 97-125.

Berkley, George B. 1969. The myth of war profiteering. *New Republic,* 20 December 1969, p. 15-18.

Bolef, Dan I. and M. Antell. 1968. Tactical nuclear weapons. *Scientist and Citizen,* May 1968, p. 91-96.

Bothwell, Frank E. 1969. Is the ICBM obsolete? *Bulletin of the Atomic Scientists,* October 1969, p. 21-22.

Bundy, McGeorge. 1969. How to wind down the nuclear arms race. *New York Times Magazine,* 16 November 1969, p. 46 ff.

Cleveland, Harlan. 1968. Pax ballistica, the uncertain peace. *Saturday Review,* 29 June 1968, p. 11-13.

Fulbright, J. W. and others. 1969. Missiles and anti-missiles. *Bulletin of the Atomic Scientists,* June 1969, p. 20-30.

Galbraith, John Kenneth. 1969. The big defense firms are really public firms and should be nationalized. *New York Times Magazine,* 16 November 1969, p. 50 ff.

Galston, A. W. 1968. Military use of herbicides in Vietnam. *New Scientist,* **38**: 583-584.

Herman, Edward S. and others. 1967. Secret contract research and the university. *Bioscience,* **17**: 524-531. CB warfare research.

Hersh, Seymour M. 1969. Germs and gas as weapons. *New Republic,* 7 June 1969, p. 13-16.

Kahn, Herman. 1969. Why we should go ahead with an ABM. *Fortune,* June 1969, p. 120-121, 212-216.

Kemp, Geoffrey. 1970. Dilemmas of the arms traffic. *Foreign Affairs,* **48**: 274-284.

Lapp, Ralph E. 1969. Fear of a first strike. *New Republic,* 28 June 1969, p. 21-24.

Larrabee, Eric. 1965. The pursuit of peace. *Atlantic,* November 1965, p. 61-65.

Larus, Joel. 1969. Nuclear accidents and the ABM. *Saturday Review,* 31 May 1969, p. 10-13.

Low, Ian. 1968. Science and weaponry. *New Scientist,* **37**: 464-465.

McCarthy, Eugene J. 1967. Arms and the man who sells them. *Atlantic,* October 1967, p. 82-86. The senator in opposition to the sale arms by the U.S. Government.

Meselson, Matthew and J. Perry-Robinson. 1969. Escalation of chemical warfare. *New Scientist,* **43**: 339-341.

Millis, Walter. 1968. On disarmament. *Center Magazine,* January 1968, p. 38-43.

Muskie, Edmund S. 1969. Blocking the ABM. *New Republic,* 7 June 1969, p. 11-12.

Rabinowitch, Eugene. 1965. About Pugwash. *Bulletin of the Atomic Scientists,* April 1965, p. 9-15.

Rathjens, George W. 1969. The dynamics of the arms race. *Scientific American,* April 1969, p. 15-25.

Rich, Alexander and John R. Platt. 1966. How to keep the peace in a disarmed world. *Bulletin of the Atomic Scientists,* April 1966, p. 14-19.

Saturday Review. 1969. The silent arsenal. *Saturday Review,* 27 September 1969, p. 14-17, 43. Abstract of a U.N. report on chemical and bacteriological weapons.

Scientist and Citizen. The May-June 1965 issue includes "Is civil defense feasible?," "Civil Defense: Project Harbor summary report," and "Critique of the Project Harbor report."
The August 1965 issue is devoted to "Project Harbor Controversy."
The February - March 1966 issue is devoted to "Defense in the nuclear age."
The April 1967 issue has an article "Nike, the Winged Goddess: Can she defend us?"
The August - September 1967 issue is devoted to "Chemical and biological warfare."

Shoup, David M. 1969. The new American militarism. *Atlantic,* April 1969, p. 51-56.

Yarmolinsky, Adam. 1967. How the Pentagon works. *Atlantic,* March 1967, p. 56-61.

York, Herbert F. 1969. Military technology and national security. *Scientific American,* August 1969, p. 17-29.

Yuter, S. C. 1969. The role of world law in arms control. *Bulletin of the Atomic Scientists,* October 1969, p. 23-25.